The American Journal of Pharmaceutical Education

THE OFFICIAL PUBLICATION OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

"If one is to excel as a workman he must possess the ability to pick out good material. One may be a fine furniture designer but if he can look beneath the surface he may frequently discover under a rough exterior, fine grain and worth while timber that will pay the workman for his effort to bring out and finish it."—Henry Baldwin Ward.

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THE AMERICAN ASSOCIATION

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THE AMERICAN JOURNAL

— OF —

PHARMACEUTICAL EDUCATION

Volume VIII ***January, 1944*** ***Number 1***

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Eulogy

Professor Zada Mary Cooper

from

American Association of Colleges of Pharmacy

After many years of devoted service to the cause of pharmaceutical education at the State University of Iowa and in a larger way as Secretary-Treasurer of the American Association of Colleges of Pharmacy, PROFESSOR ZADA MARY COOPER has severed her connections with that institution and with this organization, that she may do some things she has always wanted to do and things she has not been able to do.

Through the years of service she has, in her quiet, forceful way, been the influence around which this Association has functioned, not only in its internal affairs but in its relationship to the National Association of Boards of Pharmacy, the American Pharmaceutical Association, and the other affiliated societies. She has been the one individual who has under all conditions and in all relations kept her balance and has been able to give unbiased, competent, and constructive advice to presidents, officers and committeemen alike whenever it has been called for.

MISS COOPER'S resignation will leave a great vacancy in this organization which will remain as long as this generation of men shall ride the range, and her influence will continue to live as long as this Association lasts.

To you, MISS COOPER, we wish many long, happy and fruitful years, and season after season as this group comes together we hope you will be sitting with us, and if that is impossible, you will be with us in spirit and we will be with you.

The eulogy was approved unanimously by a rising vote.

Denver, August 17, 1942.

Comprehensive Examinations in the College of Pharmacy of the University of Minnesota

CHARLES H. ROGERS and PALMER O. JOHNSON

University of Minnesota

Written examinations were introduced into the colleges in the United States about the middle of the nineteenth century. From that time until the opening of the present century, discussions of examinations have been based entirely on opinion. Since 1905, however, we have been increasingly critical of examination practices, and there has been an increasing number of investigations of examination methods and their educational effects. Much development has taken place in the techniques of educational and mental measurement. One type of examination that has come into prominence in the last decade in a number of colleges and universities is the comprehensive examination.

About five years ago, the faculty of the College of Pharmacy of the University of Minnesota voted to substitute a comprehensive examination system for the so-called course examination system. Pursuant to such action by the faculty and before its approval by the Dean of the College of Pharmacy, a number of professional schools which were using the comprehensive examination system were surveyed to determine why they had adopted this type of examination. Most of them believed comprehensive examinations stimulated students to retain more information than did course examinations though others stated they were merely following the lead of the larger educational institutions. The Dean of the College of Pharmacy was unwilling to approve the change in examinations until scientific study and analysis had shown that comprehensive examinations provided more information about a student's scholastic accomplishments than did course examinations.

A brief of the proposed study with its objectives was submitted to the Committee on Educational Research of the University of Minnesota with a request for funds to finance the project. With the money granted, an intensive study was carried on for a period of three years under the direction of Dr. Palmer O. Johnson, Professor of Education.

The purpose in this report is to present the main points, the findings, and the significance of the investigation dealing with the construction and evaluation of comprehensive examinations in the College of Pharmacy.

The constructor of comprehensive examinations encounters on the one hand the difficulties common to the construction of course examinations and on the other hand difficulties peculiar to them. Among the latter is the special difficulty of aggregating materials of instruction over wide areas and preparing them in a test that can be said to be comprehensive in fact as well as in label. In the preparation of all examinations, the objectives of instruction should be kept clearly in mind. Unfortunately, these are often undefined. The examinations constructed in this study were designed to measure the degree of proficiency students acquired in each of several objectives of instruction set forth by the staff of the College of Pharmacy. The three primary objectives were: (1) knowledge of technical vocabulary, (2) knowledge of fundamental facts and principles, and (3) application of items (1) and (2) to the solution of problems.

The importance of carefully designed, valid, and reliable examinations is evident on the part of both the student who learns and the faculty who seeks maximum efficiency in training proficient pharmacists. The measurement of efficiency on an objective numerical basis is not only a problem of great difficulty and complexity, but the procedure must of necessity involve arbitrary, although plausible assumptions. The arbitrariness enters, for instance, in the supposition that efficiency can be measured in terms of proficiency on an examination, and that proficiency as a totality is a purely additive function of the several proficiencies in a number of subjects. Underlying educational measurement is the supposition that a student's score on an examination represents the functioning of some ability measured by the examination. Since the measurement is indirect and the nature of the function unknown, educational measurements do not have the additive property attributable to most measurements in the physical sciences. When the instruments of measurement are carefully constructed, they do serve, however, to arrange individuals in order of merit in the ability tested. Individuals responsible for the construction of examinations should be constantly attentive to the necessity of making their assumptions accord

as closely as possible with the observed facts. Statistical tools are available for testing the extent of the agreement. It is known that statistically a positive correlation exists between proficiency in examinations and later performance although individual cases can be cited in which there is no correlation, or in which the correlation may even be negative. The validity of proficiency in an examination as a measure of efficiency in pharmacy could presumably be increased by defining clearly and measuring those qualities characteristic of an efficient pharmacist. Even if these could be operationally defined, their relation to the abilities measured by the examinations would need to be established.

Since no function can be completely measured by an examination it is necessary to resort to sampling. The sampling of test situations should be evenly taken from the various objectives. The number of situations included should be sufficiently large to avoid the chance of excluding important topics. The following plan was adopted for this study:

1. Statements of the objectives of the courses to be covered by the comprehensive examinations were obtained from the instructors.
2. Graduate-student assistants, trained in the field, read the course assignments and attended each class and laboratory meeting to obtain an authentic record of the materials of instruction.
3. The materials of instruction were classified into (1) technical terms, (2) principles, and (3) factual information.
4. The assistants constructed the examination items under the supervision of the test technician.
5. The examination items were submitted to the individual instructors for validation.
6. The test technician and the research assistants met with the staff of the college for a critical appraisal of the examinations to determine how well they reflected course and curricular objectives and their validity from the standpoint of fact.

Three groups of comprehensive examinations were constructed. During the year, 1938-39, examinations were developed for the sophomore courses in the pharmacy curriculum; during the year, 1938-40, for the senior courses; and during the year, 1940-41, for the junior courses. The sophomore examinations were administered to three classes of sophomores, the classes of 1938-39, 1939-40, and 1940-41, a total of 138 students. The junior examinations were administered to the juniors of 1940-41, a class of 39 students. The senior exam-

inations were administered to two classes, the classes of 1939-40 and 1940-41, a total of 69 students. The examinations were given over a two-day period during the last week of the academic year.

It is convenient to group the discussion of the results of the investigation into four parts and to deal with each separately.

The Properties of the Comprehensive Examinations

In studies of the kind reported here, much care must be exercised in the development of measuring instruments that fulfill the functions for which they are designed. The chief properties of examinations are their validity and their reliability. Validity here refers to the power of an examination to measure the objectives set up by the instructors in the areas covered by the examination. The steps described above for the development of the examinations were largely concerned with validity. A subsidiary but important property of an examination is that of reliability. Since measuring instruments are subject to error, we must have a measure of this error in order to obtain an estimate of the accuracy or inaccuracy with which we measure. We are interested in making estimates of both the true abilities of individual students and the abilities of individual students in comparison with the abilities of others in the group; that is, we are interested in both the absolute and the relative accuracy of the examinations. The statistical description of absolute error is usually specified as the standard error of measurement of an individual's score while the description of relative accuracy is called the reliability coefficient. The simplest and most meaningful statistical tool for determining the accuracy with which an examination measures is the analysis of variance. Applications of the technique of the methods of Jackson and of Hoyt were employed. The findings from the applications of Jackson's measure of the sensitivity of a test, ($\gamma = \frac{\sigma_t}{\sigma}$, that is, the ratio of the standard deviation of the distribution of ability in the population sampled and the standard deviation of the distribution of the errors of measurement) have been recorded in an earlier report.[1] The method of Hoyt resulting in a

[1] "The Construction and Evaluation of Comprehensive Examinations in the College of Pharmacy," **Studies in Higher Education**, pp. 178-87. Biennial Report of the Committee on Educational Research, 1938-40. University of Minnesota, 1941.

measure of the internal consistency of the examination is obtained by breaking down the total sum of squares into three independent components: (1) the sum of squares "among individuals," (2) the sum of squares "among items," (3) the residual or error sum of squares. From these sums of squares and the corresponding numbers of degrees of freedom, the measure of the accuracy is obtained by subtracting the residual or error mean square from the mean square among individuals and dividing by the mean square among individuals.

The variance of the scores on an examination is a function of the variance attributable to errors of measurement, to the variance of the difficulty values of the examination questions, and of the mean of the scores on the examination. The component of the analysis of variance attributable to "among items" is useful in determining whether the examination is too easy or too difficult for the students tested. The distribution of scores from such tests are skewed and small differences among individuals result. A reliable examination must have a large value of the mean square "among individuals" in comparison with that of the error mean square. The measures of the internal consistency of the examinations developed for this study were:

Bacteriology	.94
Botany	.92
Biological Products	.73
Cosmetology	.84
Dispensing	.89
First Aid	.89
Organic Chemistry	.89
Organic Medicinal Products	.88
Operative Pharmacy	.88
Orientation	.70
Pharmacognosy and Materia Medica	.87
Pharmacognosy	.95
Pharmaceutical Assay	.92
Pharmaceutical Jurisprudence	.52
Pharmaceutical Bio-Chemistry	.86
Pharmaceutical Chemistry	.84
Pharmacy	.96
Pharmacology and Therapeutics	.81
Preventive Medicine and Public Health	.88
Physiology	.88
Quantitative Pharmaceutical Chemistry	.87
Retail Pharmacy Management	.98

It may be inferred that on the whole the tests were of sufficient accuracy to distinguish between individuals within the groups studied or to arrange the students in relative order of merit according to the abilities measured. Test of the normality of the distributions of the scores on the several examinations as well as the analysis of the mean square "among items" indicated that the examinations were well adapted to the groups tested. The criteria used for the test of normality were those of Fisher (the test of symmetry, $t = \frac{g_1}{S.E.g_1}$, and the test of kurtosis, $t = \frac{g_2}{S.E.g_2}$). The criteria for determining the appropriateness of the test for the group tested were (1) that the ratio of the mean score to the total number of items should equal .50 and (2) that the total sum of squares should equal .25 N (where N is the product of the number of individuals and the number of items in the test).

Examinations and the Improvement of Instruction

The purposes of examinations are often so narrowly restricted that tests are regarded primarily as the means of arranging students in order of merit to facilitate giving each student a grade in accordance with his achievement. In this study, the function of examinations was conceived to be instructional as well as administrative. Both functions are aspects of the same problem—that of improving upon the content and the methods of instruction in order to facilitate the development of competent pharmacists. One useful source of information to guide possible improvement of instruction resulted from the study of the performance of the students on the comprehensive examinations over the three-year period. For each question of the examinations, the number and proportion of students answering the question correctly were computed. This information is made available to each instructor to give him a basis for determining his success or failure in guiding the development of his students toward the course and curricular objectives. The extensive tabulations cannot be reported here, but illustrations are presented from several of the comprehensive examinations. From an examination of these illustrations, the reader can observe some of of the types of examination situations used in this study and can note the variations in the percentages of correct responses to the several kinds of questions.[2]

Specimen Test Situations and Their Difficulties

Examination Situation in Botany

You receive a shipment of leaf drugs. The package contains three kinds of leaves representing three different drugs. You are asked to separate the three leaf drugs on the basis of the description furnished. Leaf A is lanceolate in shape, with a rounded base and an acute apex, the margin sharply serrate and the upper and lower surface fairly pubescent. Leaf B, is of ovate shape, an unequal tapering base, and acuminate apex, a serrulate margin and upper surface fairly pubescent and the lower surface densely pubescent. Leaf C is ovate to ovate-lanceolate in shape, its base tapers into the petiole, its apex is obtuse to rounded, the margin is dentate-crenate and upper surface is slightly pubescent and the lower surface heavily pubescent. All the leaves are approximately of the same size and color. From the following, select the character or combination of characters which would best be used to distinguish the leaves.

1. If the leaf drugs were broken or entire:

Percent of Correct Responses*			Percent of Correct Responses		
28	—	a. apex	49	—	e. shape and base
41	—	b. shape	46	—	f. base and margin
30	—	c. margin	75	+	g. apex and margin
39	—	d. base			

*The percentage of correct answers in a class of 61. A (—) sign in the blank indicates the character or combination of characters would not be used to distinguish the leaves; a (†) sign indicates that the character or combination of characters would be used.

Examination Situation in Dispensing

Name and define, or give the significance of, each of the numbered parts of the following prescription placing the name first and then the definition or significance of each item in the appropriate column at the right.

[2]In addition to the use reported here for the proportion of correct responses, the difficulty values for students of various levels of ability enable the determination of the discrimination power of examination questions. This has been done for the examinations described here, but the results are not reported. This information was used to increase the effectiveness of the examinations for further use.

	Name	Per Ct. Correct	Definition or Significance	Per Ct. Correct
1. Mrs. R. Jones 2207 Hilditch Ave. Mpls., Minn.	1. Name and address*	93**	Required by law on narcotic ℞*	29**
2. May 27, 1941	2. Date written	100	Required by law on narcotic ℞	36
3. ℞	3. Superscription	89	Take and how	82
4. a) Cod. Sulf. gr vi b) Syr. Ipecac dr iss c) Syr. Sarsap. oz ii d) Aq. qs ad oz iii	4. Inscription	75	Ingredients	89
5. M. ft. sol.	5. Subscription	75	Direction for pharmacist	100
6. Sig: dr i p.r.n. for cough	6. Signature	79	Direction for patient	93
7. M. Dupont, M.D. 3642 Tower Ave.	7. Doctor's name and address	100	Required by law on narcotic ℞	29
8. Reg. No. 624	8. Doctor's registry number	100	Required by law on narcotic ℞	54

Item 4 of the above prescription is divided into four parts which have specific names. Name and define these under the appropriate columns below.

	Name	Per Cent Correct	Definition	Per Cent Correct
9 (4.a) Cod. Sulf.	9. Base	4	Active ingredient	96
10 (4.b) Syr. Ipecac	10. Adjuvant	75	Aid to active ingredient	75
11 (4.c) Syr. Sarsap.	11. Corrective	36	Corrects action of active ingredient	61
12 (4.d) Aq.	12. Vehicle	79	Carries the others in solution	54

*Filled in by student.
**Percentage of students answering each item correctly.

Examination Situation in Organic Chemistry

The following exercise is intended to test your ability to apply some of the fundamental principles of organic chemistry. You are given a key list of organic compounds. In each question following this list you are given an empirical formula and a certain amount of information which should enable you to pick out from the key list the compound which fits the data. Place the key number corresponding to your choice in the blank at the left of the question.

Key No.		Key No.	
1.	anti phenyl acetaphenone oxime	7.	trimethyl acetic acid
2.	di-ethyl ketone	8.	n-valeric acid
3.	ethyl benzene	9.	n-valeraldehyde
4.	n-propyl methyl acetic acid	10.	m-xylene
5.	n-propyl methyl ketone	11.	o-xylene
6.	syn-phenyl acetophenone oxime	12.	p-xylene

Percentage of Correct Responses*	Answer		
2	11	1.	A hydrocarbon C_8H_{10} when nitrated gives two isomeric mono nitro derivatives.
35	7	2.	An acid $C_3H_{10}O_2$ when treated with phosphorous and bromine failed to form the substituted bromo acid. Select from the key list the correct formula.
41	5	3.	A ketone, $C_5H_{10}O$, when treated with sodium hydroxide and bromine showed a reaction and the precipitated product was shown to be bromoform. Select from the key list the correct formula.
37	1	4.	When an oxime of acetaphenone was treated with PCl_5 and the resulting compound hydrolyzed, aniline and acetic acid resulted. Select from the key list the correct formula.

*The number of students was 46.

Examination Situations in Pharmaceutical Assay

1. In the precipitation of a sulfate from a 0.6000 Gm. sample, a precipitate of 0.6800 Gm. of barium sulfate was obtained. The correct calculation for the percentage of sulfate in the sample is:

Per Cent of Correct Responses				
80	x	a.	$\frac{0.6000 \times 0.1379 \times 100}{0.6800}$	% sulfate
		b.	$\frac{0.6800 \times 0.6086 \times 100}{0.60000}$	% sulfate
		c.	$\frac{0.6800 \times 0.4115 \times 100}{0.6000}$	% sulfate
		d.	$\frac{0.6000 \times 0.6086 \times 100}{0.6800}$	% sulfate

2. A pharmacist finds he has exactly 1000 cc. of a solution of sodium chloride of unknown strength. He used 10 cc. of this solution according to the directions for the assay of sodium chloride using standard silver nitrate solution. 50 cc. of silver nitrate solution N/10 were used and it took 15 cc. of N/10 ammonium thiocyanate solution to precipitate the excess silver nitrate solution in the 50 per cent aliquot portion. Since this solution was stronger than was desired, a quantity of water was added and the solution was assayed again. This time, 20 cc. of N/10 ammonium thiocyanate solution were required to precipitate the excess silver nitrate in the 50 per cent aliquot portion (10 cc. sample). This solution was then too weak, so a quantity of sodium chloride was added, and the solution was assayed again. This time, it took 18 cc. of N/10 ammonium thiocyanate solution to precipitate the excess silver nitrate. Assuming that there was no loss in transfer and that there was no increase in volume due to the addition of the solid sodium chloride, how much water and how much sodium chloride were added?

Per Cent of Correct Responses (N = 39)	Answer
23	990 cc. of water
15	4.57 ± .2 Gm. NaCl. 70.

Examination Situation in Pharmacognosy

Which of the following are concerned with alkaloidal bases, alkaloidal salts and glucosides? In the columns so designated, place a (+) sign preceding those properties which are true. Place a (—) sign preceding those properties which are not true.

	Alkaloidal Bases		Alkaloidal Salts		Glycosides		Property
	Percentage of Correct Responses*	Correct Response	Percentage of Correct Responses	Correct Response	Percentage of Correct Responses	Correct Response	
1.	50*	(—)	77	(+)	59	(+)	1. Soluble in water
2.	80	(+)	27	(—)	73	(+)	2. Soluble in 95% alcohol
3.	67	(+)	33	(—)	55	(+)	3. Soluble in chloroform
4.	41	(—)	41	(—)	36	(—)	4. Soluble in petroleum ether
5.	80	(—)	81	(—)	86	(+)	5. Yields sugar or some carbohydrate on hydrolysis
6.	86	(+)	81	(+)	59	(—)	6. Forms a precipitate with tannin or tannic acid
7.	66	(+)	77	(+)	64	(+)	7. Can be extracted from vegetable drug powders by hydro-alcoholic menstrua

*The number of students was 64.

Examination Situations in Pharmacognosy and Materia Medica

1. If you would fill a prescription containing the amounts of the ingredient mentioned below, mark the statement with a (+); if you would not fill the prescription, mark the statement with a (0).

Percentage of Correct Responses	Correct Response	
63	(+)	1. A prescription containing 1 grain of opium per dose.
95	(0)	2. A prescription containing 8 grains of digitalis per dose.
95	(+)	3. A prescription containing 15 grains of Cascara Sagrada per dose.
34	(+)	4. A prescription containing 30 grains of Ergot per dose.
92	(0)	5. A prescription containing 15 grains of Belladonna Root per dose.

2. Solve the following problem and give the answer in the terms asked for in the space provided.

A Tincture of Digitalis is assayed by the USP one hour frog method. A dose corresponding to 0.0045 cc. per grain of body weight of the original tincture stops the heart in systole in 3 out of 5 frogs; a dose of 0.005 cc. per Gm. of body weight stops the heart in systole in 4 out of 5 frogs; and a dose of 0.0055 cc. stops the heart in systole in 5 out of 5 frogs. The standard reference powder of digitalis contains one International unit in 64.5 mgm. of the powder. A reference tincture is made from this reference powder using 0.645 gm. of the powder for each 10 cc. of the reference tincture. When assayed according to the USP method as above, 0.0065 cc. per gram of body weight of frog stop the heart in systole in 3 out of 5 frogs; a dose of 0.0070 cc. stops the heart in systole in 4 out of 5 frogs; and a dose of 0.0075 cc. stops the heart in systole in 5 out of 5 frogs. Calculate the number of International units per cc. of the Tincture of Digitalis.

Percentage of Correct Responses*	Correct Response	
53	1.4	(International units per cc. of the Tincture of Digitalis)

*The number of students was 38.

Examination Situation in Pharmacy

Answer the specific questions about the following preparations. The names and formulæ are given for a set of preparations which are probably unfamiliar to you. Base your answers on the information which you have acquired about the official preparations.

Solution of iodine and zinc phenolsulfonate

Potassium iodide	15 gm.
Iodine	20
Zinc phenolsulfonate	15
Glycerin	25 cc.
Distilled water, qs ad	100

Per Cent of Correct Responses*	
89	1. Why is potassium iodide used in this preparation?
81	2. Write the equation of the reaction which takes place.
2	3. What condition other than heat favors the reaction?
54	4. What is the solubility of potassium iodide in water?

*The number of students was 63.

Examination Situation in Operative Pharmacy

The following formula is given for 1 part of product. Calculate the amounts required to make 1000 cc. expressing the quantities in cc. or gm. and place in the appropriate space provided at the left of each statement. Show your calculations.

Percentage of Correct Responses*	Answer	
47	250 cc.	1. F. E. Senna f oz iv
40	5 cc.	2. Oil Coriander M xxxviii 4/10
3	635 Gm.	3. Sucrose oz ix dr v gr xiii
	qs. 1000 cc.	Aq. qs. O i

*The number of students was 68.

Examination Situations in Retail Pharmacy Management

Purchase of a Store

I.

A store is priced for sale at $7000. The owner breaks down his price as follows:

Merchandise value (at cost)	$3000.00
Fixtures value	3000.00
Supplies	100.00
Goodwill	900.00

He states that last year's sales total was $30,000 with an average markup of 30 per cent of retail prices and that the store can always be counted upon to show three and a half turnovers a year. The lease has a year to run and calls for $75 a month rent. Salaries and miscellaneous expenses for the past year were $6000.00.

Suppose that you judge that you can increase the business of this store to four turnovers in the first year, while elevating the markup to 31 per cent of retail prices, and that you can save $28 a week salary.

Assuming that merchandise and other tangibles offered for sale are soundly evaluated, are you justified in paying the price asked?

Show all calculations and label clearly. Scratch figuring can be done on other paper and not be shown here, but steps in arriving at answers are requiured, and answers which are accompanied by incomplete explanation can not be accredited.

Calculation of last year's net profit of stock on hand*:

		Percentage of Correct Responses
Sales (3½ x $3000) / 70%	$15,000.00	
Cost of mdse. sold (3½ x $3000)	10,500.00	3
Gross Profit	4,500.00	—
Expenses		
Rent (12 x $75)	900.00	43
Salary—Miscellaneous	6,000.00	38
Total Expense	6,900.00	28
Net Loss	$ 2,400.00	

Estimation of your first year's profit on basis of stock on hand:

Sales (4 x $3000) / 69%	$17,391.30	3
Cost of mdse. (4 x $3000)	12,000.00	8
Gross Profit	5,391.30	5
Expenses		
Rent (12 x $75)	900.00	10
Sales—Miscel. ($6000—(28x52)	4,544.00	18
Total Expense	5,444.00	10
Net Loss	52.70	

Store is obviously a "store situation" for sale—stock is down too much (price is too high).

*This part filled in by student.

Other problem situations included in this examination were:

1. Preparation of a running balance sheet, showing changes in capital resulting from a set of transactions. (These transactions were described in the test situations.)
2. Preparation of a profit and loss statement for a silent partner in the Service Drug Company for the month of July, 19—. Students were required to put the totals of the items given in their proper classifications. (In this test situation, the transactions for the month were listed.)
3. Problem relating to operating costs.
4. Problem relating to advertising.
5. Problem relating to sales quota.
6. Problem calling for the determination of the quota of business necessary in order to realize a $150 a month average net profit for a three-months' period.
7. Problem in determining the optimal number of clerks.
8. Problem calling for the preparation of the journal, ledger, and a trial balance, closing the various proprietorship accounts, posting from entries in the journal, and preparing a new trial balance, the balance sheet, and a profit-and-loss statement.
9. Problem calling for journal entries and posting to ledger in closing specified accounts and distributing the net profit or net loss on the basis of investments.
10. Problem in opening a depreciation account and charging the depreciation for the past year, then closing the depreciation account into profit and loss.
11. Problem in buying—comparing the chain discount 20, 10, 2 per cent on a $15 a dozen item with a "2 free from 12" offer on the same item.
12. Problem in selling—determining the maximum price at which an article can be billed per dozen if it is received C.O.D. under 2/10 terms of sale.
13. Problem in stocking an article.
14. Problem in use of the want book.
15. Problems in pricing for retail sale.
16. Problem in meeting bills.
17. Problems in inventory.

One common finding from the analysis of all the comprehensive examinations was that the objective students least adequately achieved was the ability to apply facts or principles to the solution of problems. The problems were chosen as widely as possible from the kinds of problems met by the practicing pharmacist. An implication of educational significance is that instruction in the several areas should be re-directed toward the development of the ability to solve prob-

lems. We cannot assume that the mere memorization of facts and principles insure their integration and application. Another finding of significance relates to the background training of the sophomore students in elementary physics and chemistry. The examination over these areas included sections on vocabulary, facts and principles, and problems of application. Here again the weakness of the student to apply knowledge of physical and chemical principles to the solution of rather elementary problems was pronounced. Space prevents presenting other findings of educational significance.

Thus far, brief consideration has been given to the problems of constructing comprehensive examinations, the methods of determining their properties, and the information obtained from the examination results which has potential value in the improvement of the educational program. We shall now turn to two other applications of the examination results: (1) the relation of comprehensive and course examinations and (2) the comprehensive examinations as predictive criteria.

The Relation of Comprehensive and Course Examinations

A question of considerable practical significance is whether or not the comprehensive and course examinations (or other measures of student achievement) used by the instructors measure the same functions.

For the 1938-39 group, the instructors' grades in midquarter examination, laboratory tests, final examinations, and average of weekly tests were weighted to yield the "most predictable criterion" score for each student for each of three subjects: (1) pharmaceutical chemistry, (2) pharmacognosy, and (3) pharmacy. The "most predictable criterion" score is determined by choosing weightings for the several measures so that the generalized variance of the several test scores of all the individuals receiving a given linear score obtained by using these weights is minimized. Thus the best ranking of the individuals that these measures will provide is assured. The coefficients of correlation between the scores on the comprehensive examinations and the "most predictable criterion" scores were as follows:

In Pharmaceutical Chemistry:	$N = .66$;	$P < .01$
Pharmacognosy Chemistry:	$N = .68$;	$P < .01$
Pharmacy Chemistry:	$N = .56$;	$P < .01$

For the 1939-40 group, the instructors' numerical grades for each student on the several course examinations were averaged separately for each of four subjects: (1) pharmacy, (2) pharmaceutical chemistry, (3) pharmacognosy, and (4) botany. The coefficients of correlation between the mean scores on the several examinations given by an instructor in his course and the scores on the comprehensive examinations for each course were as follows:

In Pharmaceutical Chemistry:	$r = .74$;	$P < .01$
Pharmacognosy:	$r = .59$;	$P < .01$
Pharmacy:	$r = .77$;	$P < .01$
Botany:	$r = .85$;	$P < .01$

When the data for the three groups of sophomores (1938-39, 1939-40, and 1940-41) were collated,[3] the following correlations were found between the scores on the comprehensive examinations and the numerical average for the instructor's examination in corresponding courses:

	N	r
Botany	129	.77
Orientation	110	.18
Pharmaceutical Chemistry	138	.68
Pharmacy	134	.75
Organic Chemistry	99	.54
Pharmacognosy	137	.58

The range in the corresponding correlation coefficients for juniors was from .43 in biological products to .80 in bacteriology.

The correlation coefficients for the combined groups of seniors were:

	N	r
Dispensing	69	.59
Quantitative Pharmaceutical Chemistry	66	.39
Cosmetology	68	.61
Organic Medicinal Products	67	.64
Pharmaceutical Bio-Chemistry	65	.63
Preventive Medicine and Public Health	57	.53
Pharmaceutical Jurisprudence	35	.40

[3] All scores used in this analysis were relative deviate scores based on each year group.

Of the respective measures used in this investigation, it was found that in spite of a substantial communality of function, each of the two methods of measuring student achievement contributed independent as well as joint information. The percentages of overlapping between the comprehensive

and course examinations in specific courses in the sophomore curriculum ranged from 3 to 60 per cent; in the junior curriculum from 18 to 64 per cent; and in the senior curriculum from 15 to 41 per cent. A probable explanation is that the comprehensive examinations were based upon the more complete objectives of the courses, while the instructors' examinations were unsually limited to the measurement of factual information. Moreover, an analysis of the reliabilities of a sampling of the instructors' examinations revealed that rarely was the reliability coefficient of an examination above .75.

The Comprehensive Examinations as Predictive Criteria

For a number of years, the College of Pharmacy has administered to entering students a battery of tests in science and in mathematics. Scores on these tests combined with the honor-point ratios of the student in the College of Science, Literature, and the Arts have been used for predicting the probable achievement of students in the College of Pharmacy. This situation made it possible to compare the comprehensive examinations with the college honor-point-ratio as a predictable criterion. The method generally employed in problems of this nature is known as the multiple regression method which gives a weight to be assigned each measure to obtain the best prediction. The coefficient of multiple correlation (the correlation between the predicted and observed values) is the best measure we can use of the accuracy with which the criterion scores may be estimated.

Table 1
Coefficients of Multiple Correlation for Specified Criteria of Success in the Sophomore, Junior, and Senior Years, and Four of the Predictable Variables

Multiple Correlation Coefficients for Different Groups	Criteria of Success			
			Courses Covered by Comprehensive	
	H. P. R.	Comprehensive Examinations	H. P. R.	Combined Average
		Sophomore Year		
N = 80	.694**	.745**	.695**	.702**
		Junior Year		
N = 29	.617*	.677*	.684**	.676**
		Senior Year		
N = 39	.588**	.574**	.395	.446*

*Significant at the level P = .05.
**Significant at the level P = .01.

The findings from this study suggested that the comprehensive examinations at least equalled or surpassed the honor-point ratio as a predictive criterion for the battery of freshman measures. (See Table 1.)

Often no criterion of success in an academic or a professional field is available after graduation. Therefore, securing the scores made by the seniors on the Minnesota State Board examination in Pharmacy for use in this study was fortunate. These scores provide a criterion of success in pharmacy which is outside the College of Pharmacy and is the last criterion available before the individual starts to practice his profession. Furthermore, the performance on this criterion is the factor determining whether or not the individual is permitted to practice his profession in the state of Minnesota.

Several of the correlatons between the numerical averages on the State Board Examinations and specified criteria are reported below for the 65 seniors in the combined groups of 1939-40 and 1940-41:

1. Combined score on senior comprehensive examinations and average on State Board Examinations: r = .68.
2. Honor point ratios on courses covered by senior comprehensive examinations and average on State Board Examinations: r = .63.
3. Numerical average on courses covered by senior comprehensive examinations and average on State Board Examinations: r = .63.
4. H. P. R. sophomore year in Pharmacy and average on State Board Examinations: r = .66.

These correlation coefficients indicate that all of the measures specified above were equally effective in predicting success on the State Board Examination.

It is also worthy of note that the multiple correlation between the average of seniors on the State Board Examinations and the pre-entrance battery of measures mentioned earlier was .50.

Summary and Implications

The principal findings from the study of comprehensive examinations in the College of Pharmacy at the University of Minnesota were:

1. While course examinations and comprehensive examinations of the kinds developed and used in this experiment had a substan-

tial communality of function, the course examinations did not serve the same purposes as did the comprehensive examinations. The percentages of overlapping of the two methods of measuring student achievement ranged from 3 to 60 per cent in specific courses in the sophomore curriculum, from 18 to 64 per cent in the junior curriculum, and from 15 to 41 per cent in the senior curriculum.

2. Of the objectives measured by the comprehensive examinations, the one least well achieved was the development of the ability of the student to apply knowledge to the solution of problems.
3. Performance on comprehensive examinations at least equalled if not surpassed the honor-point ratio as a predictive criterion for the battery of freshman measures used in the College of Pharmacy.
4. A coefficient of correlation of .68 was found between the scores of seniors on the senior comprehensive examinations and the average scores on the Minnesota State Board Examinations.

The import of studies of the kind reported here is perhaps best realized by pointing out their relation to some of the broader problems of which they are a part.

A primary function of the University is to prepare students for the professions or for other occupational fields which render social, economic, and moral service to the state and, to a considerable extent, to the nation. There are approximately 1,800 practicing pharmacists in Minnesota. In the past, the admission of ambitious young people into professions was based on a *laissez faire* doctrine in which the interest of the individual was paramount. The interest of the public was much neglected. But now this principle is being vigorously questioned. The interest of the public is becoming more significant. While examinations are not the only means for the selecting and accrediting of individual students, they are—and are likely to continue to be—of fundamental importance. One function which examinations may serve is analogous to that of a refracting prism; the potential student population, made up of a mixture of individuals of various intellectual energies or wave lengths may be regarded as the white light. The ideal examination should arrange this population in order of merit or, like the prism, give us pure colors. Poor examinations function like an imperfect prism, which gives blurred or blended colors. It is of primary importance, therefore, that we remain continuously attentive to the improvement of our instruments. The reliability of examinations becomes extremely important when the selection

of young people best equipped to serve society is dependent upon them. Three questions of fundamental importance with respect to the potentialities of a student are: (1) "How much has he learned?" (2) "How much can he learn?" and (3) "How much more will be learn?" The role of accurate measures for valid answers is clear.

In addition to the problem of selecting the more potentially able students, there is the more general one of what should constitute appropriate education for the pharmacist during the whole training period from the time of entrance (and even before entrance) to the University through his admission to practice (and even after entering practice). It is a fact that the education of the pharmacist no more begins at the time he begins the formal study of pharmacy than it ends when he is formally certified as proficient. The pharmacist's general eduucation cannot be wholly separated from his professional education. This problem of general and special education is, of course, not limited to the training of pharmacists. Sections of the comprehensive examinations developed in the study reported here, as well as the predictive measures used, were designed to provide information on this significant educational problem.

There is a rather prevalent notion that no one can be expected to know a thing unless it has been formally taught him; also that if something has been formally taught a student, that fact assures his comprehension of it. The corollary is that the curriculum in pharmacy should give formal instruction in everything an ideally trained pharmacist needs to know. The faculty of the College of Pharmacy considers this point of view unsound. It is interested in knowing not only what academic and professional training it can best give but also what it can leave out, because the understandings or skills can be acquired best by experience. The results from the comprehensive examinations contain important information on these matters.

There are, perhaps, few things more ephemeral than factual information. If acquisition of factual information becomes the principal or only objective of instruction, the outcome is very ephemeral, indeed. The comprehensive examinations designed in this study did not overlook the importance of the measurement of the acquisition of accurate knowl-

edge, but they emphasized as well the measurement of the power of the student to weigh and appraise information, to know what sources of information exist and how to utilize them, and to solve the kinds of problems that will confront him as a practicing pharmacist.

One of the problems, then, in providing a good education in pharmacy is that of finding a common educational denominator of numerous and diverse educational factors and of student characteristics. Our last thought must recall that in this search, examinations—both course and comprehensive—should and can, when designed for the purpose, play an important part.

The Remington Medal Address*

ROBERT P. FISCHELIS

Remington Medalist, 1943

Secretary and Chief Chemist, New Jersey Board of Pharmacy and Chief of the Chemicals, Drugs and Health Supplies Branch, Office of Civilian Requirements, War Production Board, Trenton, New Jersey, and Washington, D. C.

While the Remington Medal Award confers a great honor upon the recipient, its purpose is also to commemorate the labors of a man whose leadership in the profession of pharmacy was the most outstanding of his time. Joseph P. Remington was a man of many talents. Charles H. LaWall, his pupil, assistant, co-worker and successor, described him as "genial and eloquent, a keen student of human nature, a lover of the beautiful in art, music and literature, possessed of a fund of scientific knowledge of unusually broad scope, and with it all a consciousness of power that made him an acknowledged leader among men—these are some of the qualities that were combined in him to make a great teacher, a capable executive and a Christian gentleman, clean-minded and clean-hearted."

Back in the spring of 1908 members of my class at the Northeast High School of Philadelphia made the customary three day pilgrimage to Washington.

On the trip from Philadelphia to Washington, which for most of us was the first experience of riding in a Pullman car,

*Read on the occasion of the presentation of the Remington Medal, New York City, December 7, 1943, and published here at the request of the editor.

we naturally set out to explore the equipment in these palatial surroundings. Some of us wandered into the smoking compartment and there sat a man apparently quite deep in thought, puffiing away at a cigar. Obligingly he moved over into a corner of the compartment and beckoned us to come in and sit down. He proved to be a very genial individual who became very much interested in our trip. His conversation was so entertaining that we lost all track of time. I do not recall any mention of the word "Pharmacopœia," but when we got ready to leave the smoking room, one of our group remembered the little autograph books and asked the kindly gentleman for his signature. We all followed suit and he obligingly autographed each book. When we looked at the signature it read "Joseph P. Remington." Somebody whispered, "Gee! That's the Dean of the Philadelphia College of Pharmacy." This was my first contact with Professor Remington, and I confess that I was only dimly aware of what an important personage he was in the field of activity which I, at that time, had never dreamed of following.

Only a few months later when my pharmaceutical experience began in the retail pharmacy of James Huston in Philadelphia the name of Remington assumed rather large proportions, for we daily referred to his text book and to the Dispensatory bearing the names of Wood, Remington and Sadtler.

A few years later it was my privilege to attend meetings of the Philadelphia Branch of the American Pharmaceutical Association and the Pennsylvania State Pharmaceutical Association at which Remington's words were always awaited with great interest and where his speeches usually closed the debate on any controversial subject and led to the final action taken.

Later, when the Pharmacy Department of the Medico-Chirurgical College of Philadelphia merged with the Philadelphia College of Pharmacy I had the honor of serving as a member of the combined teaching staff under his deanship for a short period preceding his death on January 1, 1918.

The twenty-five years that have passed since Remington was called to rest have been filled with stirring events which have left their mark upon American pharmacy. The period ahead of us looms as one of tremendous progress in the fur-

ther conquest of disease. At this very moment we are in the midst of revolutionary changes in the treatment of diseases which have hitherto baffled those who have devoted their lives to the development of the healing arts. Apparently this global war is not to be without its compensations in the form of improved methods of fighting and preventing disease.

It is necessary for American Pharmacy to gear itself to these revolutionary changes and to ask itself frankly and incisively whether it is prepared to play the part it should be expected to play in the general scheme of making these advances in medical science available adequately to all the people.

Neither pharmacy nor medicine can isolate itself from world affairs. Their services are part and parcel of the more abundant life for which nations all over the world are struggling and for which men of the United Nations are today making the supreme sacrifice in distant places.

The lofty idealism of the professions engaged in providing medical care must be translated into the practical performance of making the fruits of modern medical science available to the sick, the halt and the lame in all stations of life at a cost which they can afford to bear and under a system of distribution which will preserve their self-respect.

This is not a problem which the professions can solve alone. It is a problem for the people to solve through their chosen representatives in cooperation with the professions engaged in providing medical care. Members of the health professions must approach this problem in their dual capacity as citizens and as experts in this sphere of activity. As citizens they have every right to express opinions on the methods by which medical care should be made fully available and advocate the methods of distribution which to them seem best.

As professional men and women, skilled in one or more of the sciences or arts which constitute the practice of medicine in its broadest aspects, it is their duty to watch over the quality of medical care dispensed, regardless of the system of distribution which may be developed, and to achieve by moral suasion and good example that excellence of accomplishment which cannot be secured by legislative fiat or regimented compulsion.

I am not one of those who subscribes to the oft-repeated statement that any change in the method of distributing and paying for medical care will lower its quality. I am aware of the indifference which job security and regimentation breed in some individuals who are not overly ambitious. But I am also aware of many complaints of careless practice, incompetence and cold disregard of the human being seeking relief from mental or physical ills under the present system of private practice. I also know that for many years the medical profession has exercised a firm control over admission to that profession and it has had a very large number of young men and women with high qualifications to choose from. Whether or not the aptitude and intelligence tests employed have served to select the combination of intellectual capacity, technical aptitude, character and social conscience required to make the kind of a doctor we like to read about, is still an open question. Certainly the right kind of doctor will give the best he has in him at all times and under all conditions, and the same thing holds true for other professions in the health field.

After all, it is the men and women who enter these professions rather than the machinery set up for the discharge of their professional functions which determine the quality of medical care made available for the American people.

Pharmacy, like medicine, must exercise due care in the selection of its future manpower. The reduction in professional personnel caused by the war with its consequent elimination of some drug stores is not without its compensations. From all over the country comes the information that pharmacists are so busy practicing pharmacy in the drug stores of America that they have less and less time available for the extraneous merchandising activities resorted to in order to keep their shops going on a profitable basis and they like it. This is a sign that in spite of the jokesmiths, pharmacists do place first things first, and the first duty of the pharmacist is to supply medicines.

In Remington's apprenticeship days pharmacists carried on considerable drug manufacturing in their own establishments, but in his life-time he witnessed the gradual cessation of production of medicinal compounds in the average retail pharmacy and the increasing emphasis upon the distribution of ready-made standardized and tested products.

Like many others he did not welcome this transfer of functions to the large laboratory but realized that a change of function called for a readjustment of ideas and ideals to make them fit new conditions.

It soon became evident that the readjustment in pharmacy, like the readjustment in medicine, called for more and not less education of the pharmacist. Yet the educational program for pharmacists lagged behind that of medicine and dentistry and although rapid strides have been made in the past twenty years we have not had quite the courage of our sister professions in eliminating dead wood from the pharmaceutical curriculum, establishing pre-pharmaceutical education on a collegiate level and getting rid of unnecessary teaching institutions and incompetent, unprogressive or unproductive faculty members.

But all this is on the way and it is being hastened by war conditions. We ought to refrain from giving hypodermics to institutions and faculties which are not attuned to the demands of modern medical and pharmaceutical practice and concentrate upon the survival of those institutions which are willing to demand high standards of admission and support faculties whose outlook, experience, ideals and abilities will stimulate students to look upon the practice of pharmacy as a public service as well as a method of earning a living.

Now is the time to seriously consider improvement of the future personnel of our profession by demanding pre-professional cultural training as is done in medicine and dentistry. We should hold the present minimum four year course open for the returning war veterans who have partially completed the pharmacy course or who may wish to enter it upon completing their war service, but of all new students who have not had war service, pre-professional education on a college level should be required. This will put a stop to any effort to lower the present standard pharmacy course under the guise of doing something for the war veteran. The veteran will have the advantage of the present course, which like most other college courses will doubtless continue in a modified form of acceleration, while new students will be required to take the longer course. It is conceivable that under a partially accelerated program a pre-pharmacy college year plus the present standard four year course could readily be completed in

forty-eight months. The early inauguration of such a program will keep the number of new pharmacists down to a replacement level which will prevent the establishment of unnecessary numbers of new pharmacies. This in turn will keep the emphasis in our drug stores on professional activity and hold the remuneration of employed pharmacists at a level which is commensurate with the professional service rendered, thus making the profession once more attractive to men and women who now seek other outlets for their abilities.

Had pharmaceutical education kept pace with medical and dental education and placed its pre-professional basic training on a separate basis rather than combining it with the professional training program, pharmacists would have received more equitable treatment by the Selective Service Administration and by the Military Services in the commissioning of personnel.

It has been difficult to convince these authorities that the college trained pharmacist with a baccalaureate degree and some years of practical experience in prescription or manufacturing or hospital pharmacy, or in the wholesale drug and medical supply industry is a competent specialist who is in a much better position to render service as a medical supply officer, or as supervisor of pharmaceutical work in military hospitals than the medical doctors who are assigned to such duties. With the demand for medical doctors in the armed services as great as it is and the civilian population being deprived more and more of the services of physicians, it seems only logical that medical officers in the armed services should be utilized for strictly medical duties and that supervision of pharmacies and supply activities should be assigned to capable commissioned pharmacists. It is time that any prejudice against the assumption of pharmaceutical duties by pharmacists should be laid aside in the public interest. The Congress of the United States has unanimously approved the creation of a Pharmacy Corps in the United States Army. What good reason can be advanced for failure to extend the organization of such a corps immediately to the Army of the United States? That is where commissioned pharmacists are needed today to relieve commissioned physicians of pharmaceutical and medical supply duties so that they may practice medicine either in the Army or, if they are no longer available for such duties, to be returned to civilian practice where they are sorely needed.

There is abroad in this whole great field of pharmaceutical endeavor an intense realization of the fact that pharmacy's responsibility for the preservation of health and life is on the same level of importance as that of medicine. It is a responsibility that must not be trifled with.

As science unfolds the causes of diseases, it also points the way to their prevention and cure. The day of mysticism and hocus pocus in medicine is rapidly disappearing. As it fades away we become conscious of a reduction in the number of medicaments, but the new single drug remedies are usually complex and difficult to produce. They are often as dangerous as they are beneficial. Their course from highly expensive laboratory curiosities to commercially available remedies is not only intricate but costly. To make such remedies universally available in quantities and at costs which are not prohibitive there must always be available a combination of scientific knowledge, adequate finances and a keen insight into the economics of distribution. It is in this phase of providing medical care adequately that many pharmacists find the most satisfying outlet for their abilities.

There will always be a demand for drugs and combinations of drugs required for the symptomatic treatment of the more common ailments and for diseases whose cause or specific treatment have not been discovered. The compounding of prescriptions for such use and the storing and distribution of specific remedies and making available full information on drug therapy in general will continue to occupy the hospital pharmacist, the prescription specialist and the neighborhood apothecary.

To distinguish these specialists from druggists who prefer to run variety shops with a bit of profitable pharmaceutical activity carried on as a side line, the time has come to emulate our medical specialists and establish Specialty Boards which will certify to the competence of such State licensed pharmacists as have met the higher qualifications which warrant their designation as Manufacturing Pharmacists, Hospital Pharmacists and Prescription Specialists.

The public will naturally gravitate to the well informed and professionally competent pharmacist whether he makes his headquarters in a store on some prominent business corner or whether he chooses to operate his laboratory in an office building or as part of a group clinic or health center.

The first aid which the American public was accustomed to receive in a pharmacy in Remington's early days is no longer expected today. Hospital and clinic facilities are now more adequate and except for dire emergencies no medical attention is expected from the pharmacist. There is expected, however, considerable information as to availability of medical facilities and practitioners. The neighborhood pharmacist today must not and does not attempt to replace the doctor who has departed for military service, but it is his duty to keep informed of the availability of physicians and medical services so that he can direct inquirers to the places where they can obtain the necessary help. To this extent the pharmacist is the guardian of the health of his community and therefore his professional contacts must be broadened to include social welfare agencies as well as medical organizations and departments of health.

Prior to this date two years ago the American people were divided on the question of the extent of aid to be given to our present allies in this second World War. The events of December 7, 1941, galvanized our people into a united force with a single objective. We are all proud of the achievements of our military forces and of those who have produced and distributed the enormous supplies of fighting engines, ammunition and materiel which are now contributing so largely to the winning of this war for the Allied Nations.

Pharmacy and the drug industry have also worked with a unity of purpose during this period. Pharmacists in the War Production Board, in the Army and in the Navy have carried the responsibility for the production and supply of necessary drugs to the Services, to our Allies and to American Civilians. So far they have met the essential requirements of all concerned by making necessary adjustments and by intelligent planning. In this they have had the voluntary cooperation of manufacturers, wholesalers and retail dispensers. If such team work is continued after the war ends, there should be little if any disruption of the distributive processes in the drug industry in the reconstruction period.

With its educational program adjusted to produce men and women who have a broad social and public health background as well as technical training; with a method of identifying specialists in manufacturing pharmacy, hospital pharmacy and prescription pharmacy and with leadership that

recognizes the limitations as well as the great potentialities for public good inherent in the normal functions of pharmacy, the American public may expect from our profession in the future, as in the days of Remington, responsible, enlightened and effective service in its behalf.

Chinchona and the Count Chinchon, A Translation with Supplementary Notes*

GEORGIANNA SIMMONS GITTINGER

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"One of the most important events in the history of therapeutics was the introduction into Europe of cinchona bark by the Jesuits in 1632, and later in 1640 by Juan de Vega, physician to the Count of Chinchon, Viceroy of Peru . . ."

"De Vega returned to Spain with a quantity of cinchona which he sold at Seville at the high price of one hundred reals per pound. The spread of cinchona bark through Europe was extremely rapid, though it roused acrid polemics. One might say that all Europe was divided into two camps, for or against

*The new book of Dr. Carlos Enrique Paz Soldan, "La Introduccion de la Quina en Terapeutica" (Mexico, 1941) is in effect a second edition of his "Las Tercianas del Conde de Chinchon" (Lima, 1938). Mr. A. W. Haggis papers in the Bulletin of the History of Medicine, 1941, Nos. 3 and 4, vol. X, present a different and more rigidly 20th century interpretation of the comments and omissions in the Diario de Lima written by Juan Antonio Suardo and completed by Diego de Medrano, 1629-1639.

If messages can still get through to them in that far country, the shades of the Count and Countess of Chinchon, Don Luis Geronimo and Dona Francisca, must be bewildered by the pother of the present discussion as to how was effected the cure of his malaria in that long ago Peru.

Because Juan Antonio Suardo, the faithful scribe of all those busy and frequently distressful years, died just when his written words would have been most significant; and Diego de Medrano who carried on in the final months was less meticulous, or assumed that everything had been said, we still have no precise written record that the Count's recovery was due to the cascarilla sent from Loja, and not merely a spontaneous restoration to health of a body tortured by eight years of relapsing malaria, aggravated by the frequent bleedings and purgings which were the ineluctable fate of every patient in any serious illness.

The Count's physician, Dr. Juan de Vega, who left Peru with him and returned to Spain at that time, carried in his wallets the bitter life-restoring bark and according to contemporary reports and letters reaped a handsome profit from it in Seville. Also, before he left Peru the Count made magnificent gifts to his favorite shrine, that of Our Lady of the Prado, and en route home sent more as a memorial to his wife who had just died at Cartagena.

Was the miraculous cure for which he thanked the interceding Virgin truly supernatural, or could it have been due to the potent bark?

To South America the accepted hypothesis of the recovery of the Count is that the friendly Indian gave the cascarilla to the Governor of Loja, who in turn sent it to Lima to the Count and Countess of Chinchon.

The reader of Dr. Paz Soldan's new book is left with the maxim of Thierry which he quotes, that the greatest precept given any historian is to know how to discriminate rather than confute by argument. We can feel that a thing may be so, though there is no irrefragable proof.

its virtues. Strange to say a religious factor entered into the controversy, as cinchona was brought from America in large quantities by the Jesuits, who were greatly enriched thereby, a circumstance which stirred up furious attacks from their enemies." (History of Medicine, Arturo Castiglioni, 1941, p. 557.)

Notes from the address of the Peruvian Minister Senor Alfredo Gonzales Prada in the Wellcome Historical Medical Museum, London, at the ceremony commemorating the Third Centenary of the Discovery of Chinchona: (Translation):

"When Pizarro and his armies invaded Peru to its conquest they were beset by two fevers: the fever for gold which the Indians quenched by bringing them treasure; but for the other fever, malaria, the natives hid the secret of the bark which might cure it, and let the invaders die.

"It is argued that since Garcilaso never mentioned the quina in his chronicle of the conquest, that it might have been unknown to the Incas. But the herb doctors who knew the virtues of the indigenous plants and taught them to their sons and successors reserved their cures for the Inca and the blood royal, the nobles and their relatives. The common folk cured themselves by experience. Garcilaso, son of Pizarro and the sister of the Inca, as a Spaniard must confess his ignorance of the herbs, or as a descendant of the Incas and loyal to his race, would guard their secret.

"Pedro de Osma in a letter of December 26, 1568 to the famous Dr. Monardes of Seville, writes that the Indians refuse to inform them of the medicinal virtues of numerous herbs and plants, because they are enemies and they prefer to see them die.

"La Condamine writes (1738) in similar vein, that the use of the quina bark was known to the Indians long before the coming of the Spaniards, but that for a long time they concealed the use of this specific because of their hatred of the conquerors.

"Hipolito Ruiz in his "Quinologia" 1792, declares that the Indians of the Province of Loja knew the value of the quina or cascarilla, and used it for intermittent fevers many years before the Spaniards conquered Peru.

"To South America the accepted route of its discovery is that of the Indian friendly to the Governor of Loja, who in turn sent it to the Count and Countess of Chinchon. But that was a hundred years after the coming of Pizarro, and in that time there had been Spanish governors and viceroys whose high calibre and benevolence had won a measure of confidence from the Indians."

Dr. Carlos Enrique Paz Soldan, President of the Peruvian Society of the History of Medicine, Professor of Hygiene in the University of San Marcos, Director of La Reforma Medica, and Honorary Member of the Panamerican Sanitary Commission, in a personal communication reaffirms his hypothesis of the cure of the Count of Chinchon by cascarilla. His new book, "The Introduction of the Quina in Therapeutics" (Coleccion de Monografias, BALMIS, Mexico, Compania General Editora S. A. 1941) is in reality a second edition of "The Tercianas del Conde de Chinchon," Lima, 1938.

At the suggestion of Dr. George Urdang, Director of the American Institute of the History of Pharmacy, the following translation of certain salient passages from this book is submitted, even though they reveal no absolute documentary statement that the Count received cascarilla.

From Part II, Chapter II, page 114 et seq.:

"In the spring of this year (1638) which was seldom propitious he had a particularly serious attack of his chronic illness; October 21 he suspended his official labors. The fever is high, his terrifying color affirms it, and the doctors speak frankly of "jaundice," and lest there be doubts of the nature of this effect they assert that such complication was united to a "malicious hypochondria" with "continuous fever." It is a hematic bankruptcy, the spleen and bone marrow have spent their reserves for repair and resistance and the current of blood is inundated by the products of the immense destruction of globules. The doctors did not hesitate to bleed him, with two operations on the 21 . . . " Here is Suardo's relation:

"October. On the 21 His Excellency the Viceroy was ill, for which cause he could not attend to affairs of the government, and the following day being no better of the fever he was bled twice.

"The 23 his illness increased and the council of doctors of the city described his infirmity as jaundice, malicious hypochondria with continuous fever.

"28; the doctors of His Excellency found no improvement and ordered bleeding, and the Vicereine sent to the churches and convents asking masses for the health of His Excellency, distributing candles and alms.

"November 3. His Excellency was low in health and the council of doctors and all the churches offered prayers and petitions asking Our Lord for his health for the good of the kingdom.

"8. The doctors found His Excellency better and after this day he continued to improve, though his infirmity had caused him to be in danger of his life; and the following day the Marquis of Baides, governor of Chile, came to congratulate him on his improvement.

"December 4. In the Plaza and in front of the Courts they began to build platforms for the auto de fe of the 23rd, and on the 5th they published the Bull of the Holy Crusade; but His Excellency could not go to the Convent of San Francisco as had been his custom, because of illness, and the Royal Audienca and other Tribunals went in the procession with much pomp and devotion.

"24. A company set out to take men to the aid of the kingdom of Chile. This day because His Excellency felt ill he could not make the official visits to the prisons; the Royal Audiencia went."

Let us stop and consider a moment this "sudden improvement, always increasing." Yet not bleeding nor purging, but a new element has produced this extraordinary phenomenon. The organism of the Count in his long malarial infection was in full vital decline. But in spite of that he triumphed over his terrible malady. Until May, 1639, where the Diary of Suardo ends, continued by Diego de Medrano, there is no record of a new attack.

The first of January he is sick but attends to business:

"Jan. 1639. On January 1, the meeting for election of new magistrates and aldermen and other officials was held in the Palace, because His Excellency feeling ill could not go to

the courts and city offices as was customary; Captain D. Pedro Jose de Ysasiga y Castro was elected senior magistrate."

On the tenth of the month because of difficulty in walking he used a sedan chair, but had energy to visit his confessor R. P. Diego deTorres, who gave back his soul to his Creator on the 13th. The Viceroy attended the funeral.

The 23rd his convalescence is prodigious. He was present at 5 A. M. for the auto de fe, famous in the annals of the Inquisition, and made his way from the Palace to the plaza where the Holy Office sat, and returned to the palace in the midst of a large and slow crowd. This indicates health.

Feb. 2 there is no doubt the Count has resumed his former activities and this day visited the place of Santiago and presided at a magnificent ceremony in the church of San Augustin.

There are no more references to his illness in March, April and May.

To becloud anew his name with the obscurity of mystery, the light of the Diary is extinguished. There remains only the enormous clarity which followed step by step and day by day this unique illness which tortured his body without bending the spirit of Don Luis Geronimo de Cabrera y Babadilla, IV Conde de Chinchon, Viceroy of Peru.

We are in the year 1639, but we record what tradition insistently relates that in 1638 the Governor of Loja had sent to Lima powdered cascarilla obtained from the fever tree. Legend coincides with history in a decisive point for official knowledge of its success and history as told by the huge Aragonese Cosme Buenos in "The Knowledge of the Times" later, attests that it was during the rule of the Count of Chinchon that cascarilla was discovered in Loja. This point contains no doubts.

Don Juan de Vega could not abjure his Latin, nor renounce his persistent and implacable therapy, but he treasured the bark which had come into his hands by a miracle, recording "God knows all remedies" as the Evangelist teaches. The fact invites certain deductions; these we will treat in the final chapter of this work, made possible by the distant zeal of Juan Antonio Suardo, and by the meritorious restoration of

this Diary, unique among historic documents of America, which our national history owes to R. P. Ruben Vargas Ugarte.

From Part II, Chapter III

We are plunged anew in obscurity, we no longer have the hand of Suardo giving us in his detailed chronicle the charting, the review of affairs which differentiated each day. The punctual scribe died at his duty, and Diego de Medrano, his successor, brought the Diary only to May, 1639.

Nevertheless we know with certainty that the Count of Chinchon gave over the viceregal authority to his successor Don Pedro de Toledo y Leiva, Marquis of Mancera, Dec. 18, 1639. The Count and his family remained in Lima for a short time, and on Jan. 26, 1640, he put his seal on the records which he left to his successor.

The exact day of his departure to return to his estates at Chinchon can only be fixed approximately after September of that year. The death of his wife in Cartagena in Jan. 1641 marks a stage of the itinerary, and fixes a date. Don Luis Geronimo arrived in Spain about the middle of 1641. He visited his sovereign to whom he gave an account of his activities—he had remitted more than 40 million pesos—and retired, a widower with his only son, to his estates where ascetic and alone he ceased to fix his eyes on posterity.

The faithful Suardo was not the only one to recount daily events. Diego Perez Gallego, his servant, also gave complete information of his government of the Indies. "Some Part of the Wise and Prudent Government of the Kingdoms of Peru by His Excellency the Count of Chinchon Viceroy from 1629 to 1640, With Certain Happenings for the Augmenting of the Royal Estate, as a Representative of His Majesty" is the title of a manuscript of 80 pages unnumbered, which according to the references of R. P. Ruben Vargas Ugarte, S. J. is deposited in the Royal Library of Madrid.

In his retirement, enveloped in melancholy thought of his days of splendor in Lima, and in tender memory of his noble wife, Don Luis Geronimo de Cabrera y Bobadilla gave up his spirit to God Oct. 28, 1647. He had lived 61 years and 8 days, a remarkable longevity for that time and extraordinary on account of his long malarial infection, at that time usually fatal.

What had become of his fevers? Only conjectures which permit concluding the clinical history described in the preceding pages.

It is known and so recorded that the Count of Chinchon before leaving Lima offered his future biographers an act which should quiet all doubts. At his own expense he erected a church to Our Lady of the Prado, in the very year in which he ceased to be Viceroy (1640).

On the testimony of a credible historian: "Having received marked favor from Our Lady of the Prado, the Count of Chinchon decided to erect to her a church and gave for this purpose 80,000 pesos. Not content with this" continues R. P. Ruben Vargas Ugarte, "on giving over the government to his successor the Marquis of Mancera he sent to the Virgin from Cartagena 2 large silver lamps, candlesticks, candelabra, rich vestments and carpets all marked with the arms of his house, and valued at 100,000 pesos."

This extraordinary donation may be linked with the two greatest events in the life of the Count; his "improved health" since 1638 and the death of the Countess in Cartagena (1641) from which place he sent his regal gifts to the Virgin of his preference.

Who cannot see? It is a personal vision of a spirit subjected to severe historic criticism and illumined by the singular profiles of the Count's life. Who cannot see, we repeat, that the most solemn and extraordinary part of his life in Lima was to find himself free of the implacable malarial relapses which for so many years kept him in perpetual ill health.

How can we fail to believe that this fact was not due to the medicine of his doctors but to the bark sent from distant lands, that bark later treasured in the wallets of the repatriate Don Juan de Vega, mysterious envoy of the Deity, who permitted him to escape the "clysters followed by purges" which excited the mockery of Moliere.

How can we doubt that if he took the quina, a therapeutic adventure then, he did it on the counsel of his faithful wife, unselfish and devoted nurse to whom was sent the precious unknown substance?

There were Don Juan de Vega and his colleagues who for years supported the Count with their Latin aphorisms and their lancets diminishing by daily bleedings the strength of his organism. How could they view the liberating quina other than as something supernatural?

The miracle happened and all had to accept it. A miracle indeed was the unexpected apparition of cascarilla and its effect on the tenacious tercianas, banishing the gloomy therapies which the epoch believed useful to conquer malaria.

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Message of the Chairman to the Conference of Teachers of Pharmacy*

EARL P. CUTH

Ohio State University

I have the double pleasure of being your chairman and also to welcome you to Columbus which is now my home. We also wish to extend to each one of you an invitation to visit our College of Pharmacy which is located on the Ohio State Campus about 3 miles north of here.

This year the conference will devote its time to a discussion of the Syllabus as produced by the National Pharmaceutical Syllabus Committee. More specifically we will discuss only the parts of the Syllabus that pertain to pharmacy. The parts referring to other subjects are being discussed in other sections. The divisions are:

1. Advanced Pharmacy I
2. Advanced Pharmacy II
3. Fundamental Principles and Processes of Pharmacy
4. History, Literature and Ethics of Pharmacy
5. Manufacturing Pharmacy
6. Dispensing Pharmacy

*Read before the Conference of Teachers of Pharmacy at the 1943 meeting at Columbus.

The plan is to have each of these topics discussed by one person and then to have a general discussion from the floor. Each person in charge of a division will act as leader for the general discussion. We hope you all will enter into this plan in a spirit of cooperation and helpfulness. Naturally we are limited as to time so we have placed a 20 minute limit on each leader for his part of the program. Since we only have 150 minutes it is going to crowd us to cover the field.

As we discuss the Syllabus I would like to have you devote your attention and remarks, not to whether the material set forth is too much or too little or whether a certain topic should be discussed under a different course than is indicated. These points are minor and can be adjusted in the individual college without any difficulty or without subtracting from the value of the course. It is evident that each course outlined contains sufficient material and as I understand it, the material was designed to be comprehensive but not mandatory. There are, in my opinion, far more important points that should receive our attention. Specifically some of the points are:

1. Is the Syllabus adequate for the present and the future?
2. Is there a better sequence of courses that could be followed?
3. Is it practical for all colleges to adopt a uniform curriculum?
4. Is obsolete material included?
5. Is enough emphasis placed on newer aspects of pharmacy?
6. Will the present subjects fit the need of the men returning from our armed services?
7. Should attention be given to refresher courses?
8. Should the conferences interested in the respective subjects be responsible for developing and determining material as well as time allotment for the Syllabus?

We hope that some of these points can be cleared up so that each one of us will return to our schools with a clearer conception of our work; that we will be stimulated to think and work for continued betterment of our subjects.

During the session the following recommendations were presented, discussed and adopted:

1. We recommend that a system of officer promotion be evoked for this Conference of Pharmacy Teachers. The policy of electing an entirely new group of officers each year is not conducive to carrying out a long range program. Officer promotion policies have been used in other divisions of this annual meeting for some time with good success.

2. We recommend that the Long Range Program Committee be composed of three members, each member being appointed to serve three years, the terms of office being arranged so that only one member be retired each year.

Advanced Pharmacy I
The Pharmacy of Inorganic Substances*

EARL P. GUTH

Ohio State University

A Discussion

Definition: Advanced Pharmacy I is a course devoted to a study from the pharmaceutical viewpoint of the official and non-official inorganic substances used in medicine or in the preparation of medicines.

Objectives:

1. To facilitate the application of the knowledge gained in courses in inorganic chemistry, qualitative analysis, pharmacognosy and possibly quantitative analysis and pharmacology.

2. To bring about the required familiarity with many facts connected with the preparation of the inorganic substances for use as medicines, including all preparations invoving inorganic chemical reactions.

3. To develop technical skill in preparing these medicines.

The definition of the course is clear and concise and the objectives are beyond criticism. However, we at Ohio State find that considerable adjustment in the material is needed. This is because our course covering this field is given in the second year before the students have finished their quantitative chemistry and before they have started organic material. On glancing through the outline one finds many substances and preparations that are equally organic and inorganic. For example: Effervescent Salt, Solid Soap Liniment, Soft Soap, Silver Picrate, Silver Lactate, Fehlings Solution, Magnesium Citrate, Glycerite of Boroglycerine. Perhaps this is not a

*Read before the Conference of Teachers of Pharmacy at the 1943 meeting at Columbus.

serious criticism for if we followed the Syllabus as a whole, the students would be getting the necessary organic background concurrently. Again we do not worry over this adjustment as we can acquaint the students with this material in other courses.

Objective No. 2 is in my opinion the real purpose of the course: To bring about the required familiarity with many facts connected with the preparations of the inorganic substances for use as medicines, including all preparations involving inorganic reactions. This objective is fundamental. The material in this course is basic to pharmacy. The pharmacist who possesses these facts understands how these materials should be handled and stored. He can translate this information very easily to dollars and cents as well as to the arts of pharmacy.

Is the outline adequate for the present and future? I think that it is. One needs only to keep it up to date.

Is obsolete material included? Yes, there are a number of items which no longer hold prominence but these need not be stressed.

Is enough emphasis placed on the newer aspects of pharmacy? It is here that the outline is incomplete. It may not be feasible to produce a Syllabus showing new aspects. Even some of our texts are out of date when they first appear. It is here that the individual instructor must go along on his own initiative and present new findings. This not only would keep the material up to date but would be a stimulus to the students.

This course is admirably suited to be used as a refresher course for older pharmacists and men returning to school after the cessation of hostilities.

This is only my opinion of the course and I have no serious criticism of it. We would appreciate your comments.

Advanced Pharmacy II
The Pharmacy of Organic Substances*

RALPH E. TERRY

University of Illinois

That the title, "Advanced Pharmacy," is a distinct misnomer, is an admitted fact which should be stated at the very outset. In the process of arriving at a proper name for this section of the Syllabus, a number of names were suggested, all of which were editorially rejected in favor of the present title. The old title, "Organic Pharmacy," was much superior for it did lend an interpretation readily understood by the pharmacist even though the chemist felt otherwise. And so the present title for the course was adopted.

A restatement of the objectives of the course and an elaboration of certain features properly follows. The basic purpose of the course is to teach the pharmacy student the pharmaceutical applications of organic chemicals. No matter how extensive the instruction in organic chemistry may be, it must limit itself to chemical structure, nomenclature, and certain physical properties. As an example, take the compound antipyrine. The chemist will consider this in relation to other chemically related compounds, he will discuss its manufacture and purification. Such physical properties as appearance, solubilities, melting point and reaction in aqueous solution may or may not be stressed. The presence of the nitrogen giving certain chemical effects of alkaloidal character may be brought out. If every chemical course given to pharmacy students would do this much, there would still be a number of important facts about this material left to teach in organic pharmacy. Lumped under the general title of incompatibilities, the reactions of antipyrine with heavy metals, tannin compounds, oxidizing agents and its eutectic properties with many compounds all lie outside of a chemical discussion but these are the things which are important at the prescription counter. A great number of other examples might be used, all proving that there is a distinct function in teaching organic pharmacy to supplement other instruction. Experienced teachers will agree with this viewpoint for they have found

*Read before the Conference of Teachers of Pharmacy at the 1943 meeting at Columbus.

such instruction necessary, as an addition to the knowledge learned in organic chemistry courses.

Advanced pharmacy should also bring in the relationships of organic substances to the inorganic materials used as medicines. Thus it serves to co-relate the pharmaceutically important phases of both subjects, a thing which no chemistry teacher could be expected to cover. The "salting out" effect of strong solutions of inorganic salts might be studied in a course of physical chemistry at the time of considering emulsions, and the mechanism of the action be perfectly understood by the student, but the materials used would probably be entirely foreign to any substance ever employed medicinally. Translation of this reaction to pharmaceutical mixtures should be done easily, but offers a complexity to the chemist who by usual training is unfamiliar with many of the commonly used prescription ingredients. Eutectic mixtures offer another field of study for organic pharmacy; the metallic mixtures studied in physical chemistry give no hint of the troubles the pharmacist may experience with this class of materials in prescriptions.

One of the most commonly voiced criticisms of this course has been that it has failed to keep up to the times, that a lot of outworn theories and facts of organic chemistry have been incorporated into it and that today it teaches a lot of untruths or half-truths. The answer to this can only be found by those teachers of the subject who do keep up to date and revamp the material as time goes on. The statement can be made of many other courses, because we are closest to this particular one we are aware of the situation. It is only by such meetings as these that the inspiration to rearrange and modernize the course content can be brought to the teacher of this subject. He must survey what he has been teaching, become familiar with the newer items and rearrange his lectures to the best advantage of time and subject. It calls for hard work, and considerable thought.

This, however, does not mean that all of the old should be thrown away for the new. Modern therapeutics is a changing thing, and experience shows a constantly shifting accent. What was a popular medication a year ago may be almost completely lost five years hence. However, this introduces a factor which should be taken into account, one which is partially

responsible for the plethora of items we now must consider. A medical man may be taught in his course in therapeutics to use a certain item; he will continue to use that throughout his professional life, even though some new material may be devised to take its place. Thus we must be constantly on the alert to avoid condemning completely some substance which the pharmacy student will find used to a large extent in his own experience. That this is true can be borne out by almost every one's experience in this matter. Thus we must teach considerable of the old along with the new, at all times. It requires a careful selection and results in the present unsatisfactory outline for this course.

And this brings us then to a discussion of this outline. Again, admittedly the present form is far from the ideal. Individual ideas in this respect should result in the construction of the outline best suited to the teacher himself. The text book used may be an important factor, the time allotment has an important bearing, and the position of the course in relation to the other subjects may influence the presentation. In any event, every factor must be studied and an outline constructed to suit the individual situation. Once arranged, there is plenty of subject matter, in fact careful choice is necessary to avoid overloading with too many minor details. This is where good teaching comes into the picture.

The current cry to anticipate future developments is something which should be discussed. As an example which should show how difficult such a thing is, let us consider the period of about 1935. Who then could realize the present importance of the sulfa drugs? What is there to prevent some other item of such a character being of like importance five or ten years from now? Those two questions when answered illustrate the fallacy of anticipating what the future will bring in medication. By far a more important step is for the individual teacher to be constantly revising his presentation to cover the introduction of such items without too much speculation of what their final value may be. The enthusiasm with which a great many medicinal compounds are introduced, employed and found wanting proves the care necessary in this respect.

Organic pharmacy is a necessary component in the training of a pharmacist. It must be presented with due attention to all of the factors previously discussed and if well done, provides a cap-stone in the construction of a complete pharmaceutical course.

The Pharmaceutical Syllabus*

LOUIS W. BUSSE
University of Wisconsin

In this era of controversy, there seems to be no other subject so controversial as education—and furthermore, no education so controversial as pharmaceutical education. Our topic at this 1943 meeting of the Conference of Teachers of Pharmacy is pharmaceutical education as suggested by the Pharmaceutical Syllabus, 5th ed. (tentative).

In discussing the Syllabus, I believe it best to limit my remarks to those most fundamental in nature.

The Syllabus Committee and the Syllabus as prepared have as their primary purpose the establishment of a uniform pharmacy training in the United States of America. This training is to be based on a minimum of required subjects as directed by the Syllabus. Commenting on this purely from the basis of establishing uniform minimum pharmacy requirements, the Syllabus can serve as a very useful and beneficial tool for the general improvement of pharmaceutical education in America.

If, however, the Syllabus is going to guide and control pharmaceutical education in the future, it must as a prerequisite to this control, represent pharmaceutical education in its highest and most advanced stage of thought. It is from this standpoint which I think we must discuss the Syllabus today. Does the Syllabus, 5th Ed., represent the most advanced thought in pharmaceutical education? The general objection to the outline of material under the courses included in the Syllabus seems to answer this question in the negative. The objections are both as to the type of material and time allotment for the teaching of the material in the proposed outlines. The round table discussion of the Syllabus, held at the meeting of the boards and colleges of District No. 4 in 1943 revealed this general objection very forcibly. I believe the district went on record unanimously as objecting to making the adoption of this Syllabus compulsory.

A most serious objection to the pharmaceutical education as proposed by the Syllabus is that it is not based on prelim-

*Read before the Conference of Teachers of Pharmacy at the 1943 meeting at Columbus.

inary sound fundamental training in the basic sciences. While it is true it does require most of the basic sciences sometime in the curriculum a good share of the pharmacy training is either being given before the student has his training in these fields or else is given simultaneously. Mr. Terry has expressed a similar opinion when he says "the Syllabus has retained too much of the old material and that a good part of the former instruction in pharmacy is now presented in other courses." Pharmacy is an applied science, which in practice adopts other fundamental techniques and applies them to the preparation of pharmaceuticals and therefore by its very nature requires this sound training in the basic sciences. Therefore, if pharmaceutical education is going to progress and the marks of this progress be evident by the release of better trained men in pharmacy, it must be directed toward and based on more fundamental training in the basic sciences before the boy or girl begins his or her pharmacy training.

Organic Chemistry and Organic Pharmaceutical Chemistry of the Pharmaceutical Syllabus, Fifth Edition, Tentative*

HENRY S. JOHNSON

University of Connecticut

Some time ago the secretary of this Conference wrote to me and asked if I would be willing to "evaluate and comment on that part of the Fifth Edition, tentative, of the Pharmaceutical Syllabus which deals with organic chemistry" for presentation at the September meeting. I accepted a bit hesitantly because I believed that the outline, on the whole, was quite satisfactory and that any comment I might make would be too brief and might not lead to the discussion which we want.

After looking over the outline carefully, I still believe that it covers the ground adequately and needs no drastic change. I agree most heartily that organic chemistry should be a re-

*Read before the Conference of Teachers of Chemistry at the 1943 meeting at Columbus.

quired subject and that the second year of the pharmacy curriculum, as recommended, is the best place for it. The minimum number of hours suggested, however, appears adequate only for a *general* elementary course in organic chemistry; and for this I believe the number of hours assigned to didactic and laboratory work should be reversed; that is, 96 hours for didactic work and 128 hours of laboratory work. Ninety-six hours of laboratory work, the minimum listed in the Syllabus, seems insufficient for the organic chemistry laboratory work, as the outline states that one of the objectives of the course is "to supplement the discussion with *adequate* work in the laboratory." If any great amount of so-called "organic pharmaceutical chemistry" is to be included in the course, more time for both didactic and laboratory work would be needed. It is my feeling, however, that the first course in organic chemistry should include only as much so-called "pharmaceutical chemistry" as fits in logically and smoothly, to illustrate the *general* classes of compounds and *general* reactions. In this connection, I most firmly agree with what is included under "General Considerations" for this course when it says "The *general* point of view should be stressed throughout."

As far as the detailed outline in the Syllabus is concerned, we could probably spend a great deal of time quibbling over whether or not certain reactions should be omitted and other reactions included under the various classes of compounds; but in the end I do not believe we would reach any worthwhile conclusions.

This may be an appropriate time for me to express my opinion that in a course like organic chemistry a detailed outline is not at all necessary, for a good standard textbook will cover the important topics for "the general point of view," which is really what we are aiming at, and minor differences are relatively unimportant. Elementary courses in organic chemistry in different liberal arts and science colleges cover very much the same ground, yet there are as many *minor* variations in that field as there are colleges. I believe firmly in giving the pharmacy students a course in elementary organic chemistry equivalent to and similar to what they would receive as an elementary course if they were chemistry or premedical majors.

I do not believe that anything more specific than general outlines are necessary for the courses taught in pharmacy schools which are and should be the equivalent of standard courses for the Bachelor of Science degree in other related fields. I have found out from experience as a dean that when students transfer from other schools of pharmacy, my greatest difficulty is in correctly appraising the credits to be given for the *pharmaceutical* subjects they have taken. The so-called cultural and basic scientific courses are much more alike in the various pharmacy schools in regard to content of course, credit given, and year in the curriculum than are the strictly pharmaceutical subjects. It is comparatively easy to evaluate non-pharmacy courses for transfer students from other schools of pharmacy, but the scope, sequence and credits for pharmacy courses are almost as variable as the number of pharmacy schools in the United States. I have pointed this out to the Syllabus Committee in connection with the comments they have asked each faculty to make.

Insofar as the so-called "Organic Pharmaceutical Chemistry" is concerned, I feel that a more specific outline is desirable and is needed, since there seems to be no standard course by this name in many of the colleges of pharmacy. It seems that what appears to me to be largely organic pharmaceutical chemistry is included in the Syllabus under "Advanced Pharmacy II," the "Pharmacy of Organic Substances." Under this outline (Advanced Pharmacy II) it is noted in the introduction that chemical reactions should be included as part of the course. It seems to me that the chemical reactions for the *manufacture* of many of these substances should also be included and perhaps most of the so-called "Organic Pharmaceutical Chemistry" should be combined with the pharmacy of organic substances in a single course which might better be titled "Organic Medicinal Products."

In conclusion, I would summarize by saying that I feel the present outline quite adequate for elementary organic chemistry, but that further consideration should be given to the question of what should be offered in a course in "Organic Pharmaceutical Chemistry."

The Pharmaceutical Syllabus and Quantitative Pharmaceutical Chemistry*

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To a large extent this portion of the Syllabus covers theories and techniques which are most desirable for the armamentarium of the future pharmacist and pharmaceutical chemist. However, the following I believe to be some of the shortcomings of this part of the Syllabus:

1. Inadequate minimum time requirements.
2. Omission of some important determinations.
3. Lack of integration of the prerequisite chemical subjects as applied to complete official monographs.

1. If it is assumed that much value in a determination is lost unless it can be carried out with the maximum precision required, it is obvious that a minimum of two determinations should be made. It is impossible for a student approaching new determinations to carry out check assays on the items listed in the Syllabus as required, in less than 128 laboratory hours. If we are to include in the required work some important items either omitted or now listed as optional, the minimum number of hours required would approach 192.

2. Among the items which should be added to the Syllabus are: a nitrogen Kjeldahl determination, an alcohol determination of a galenical containing interfering volatile substances, and the chemical assay of vitamins, at least thiamin and riboflavin. These latter determinations imply an understanding of the principles and applications of abridged spectrophotometry, photoelectric colorimetry and fluorometry. So extensive is the use of these methods today that the pharmaceutical chemist who lacks this background is at a distinct disadvantage.

One phase of didactic work which is not mentioned in the Syllabus is the discussion of adequate control systems and the important part which the pharmaceutical chemist plays in such systems. The shortcomings and inadequacies of many control systems in industry, with their potential hazards to

*Read before the Conference of Teachers of Chemistry at the 1943 meeting at Columbus.

the public health, have been emphasized sufficiently in the public press within recent times to preclude any further discussion of the need of proper training in this part of the subject.

3. One of the objectives of a course in pharmaceutical analysis is the understanding of how to evaluate a medicinal product with regard to purity and identity. Much may be gained by having the student run through the complete list of tests indicated within an official monograph. The present emphasis which is laid upon individual assays does not give the student a proper appreciation of the need of conformity in every respect to the official monograph. The elimination of boundaries between the various prerequisite chemical subjects is necessary to integrate and make full use of them. The student should learn the simultaneous application of qualitative inorganic and organic tests as well as quantitative methods for the proper evaluation of a drug.

The foregoing discussion can lead to but the following conclusion: that pharmaceutical analysis, because it requires a full application of the principles of general, qualitative, quantitative, and organic chemistry, is best given after these fundamental courses have been mastered. For that reason it is best offered as a distinct course, separated from quantitative inorganic analysis, and should be given preferably in the senior year. It is my opinion that, based upon a prerequisite of inorganic quantitative analysis of 32 class hours and 96 laboratory hours, a course in pharmaceutical analysis, to be given adequately, should provide a minimum of 16 class hours and 128 laboratory hours. Even with this time available, it is only by very careful planning of the work that the desirable objectives of the course can be attained.

Contributions of Early Botanists to Pharmaceutical Knowledge*

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Many, perhaps most, of the arts and sciences have had their origin since man began to record the history of his achievements. The plant sciences however are so ancient that man and his art of domesticating plants emerge together through the mists of antiquity.

According to Reed[6] the discoveries of plants and their uses may have begun in the stone age. Reed also makes these pertinent observations: "Every important agricultural plant is a human achievement because it represents, not only discovery, but profound modification of a wild species. The degree to which plants have been modified, whether consciously or unconsciously for human needs is a measure of man's ability to stabilize his environment."

The discovery of plants suitable for food is not the exclusive prerogative of the human animal; as other animals, some far down in the scale of evolution possess the ability to select suitable food plants. A much higher order of inteligence is required to select plants or plant products that possess the property of alleviating bodily ills. In those ages before it was possible to determine the reaction of a purified drug on cellular and protoplasmic activity the art of healing was more of a guessing game than it is even in our present enlightened age.

The earliest attempts to discover plants with healing powers were purely on a trial and error basis; obviously some plants contained poisons that killed the patient. Others were less toxic and the patient got well—but then, even as now, the patient might have recovered anyway.

Botany as a science owes its origin to those ancient pioneers who adapted wild plants to human uses and sought constantly to improve them. It is doubtful in this sense whether pharmacy owes more to botany or whether botany is not more

*Read before the Second Annual Seminar of the American Institute for the History of Pharmacy, Purdue University, July 1942.

deeply indebted to pharmacy. The number of plants used by man for food, clothing and shelter were then, and still are, comparatively few when contrasted to the entire plant kingdom. On the other hand, *any* plant was the potential source of a healing drug and no plant could be overlooked in such a search. Had it not been for this constant floral exploration our knowledge of many plants would have remained most fragmentary at least, until comparatively recent times when man has become intelligent enough to appreciate that any object of nature is worthy of study for its own sake and not merely for its utility.

Among those first known to take an active interest in drug producing plants were groups of men since known as "Rhizotomi." These individuals as the term suggest were root gatherers. They made a profession out of this which was highly paid and poorly respected. Their major interest in roots was based on the interesting assumption that since many plants were perennial only in their roots the peculiar chemical properties of the plants must become concentrated in the roots. There might be similar medicinal properties in the leaves and herbaceous stems of the same plants but those properties would be more diluted. The Rhizotomi thus made two contributions to botanical knowledge; information concerning plants that might otherwise not have been investigated, and in emphasizing the importance of the plant root they called attention to a part of the plant almost entirely ignored by other students of plants. There were many superstitious practices and theories associated with the activities of the Rhizotomi. Much of the superstition was excusable for there existed little accurate information concerning plants upon which the Rhizotomi could have based a sound philosophy. On the other hand, the root gatherers were in ill repute in their day because they deliberately fostered superstitious ideas in order to acquire and maintain a restricted monopoly among the members of their profession. Theophrastus[8] has recorded for us several examples of the absurd directions advocated by the root gatherer's profession.

"Further we may add statements made by herb dealers and herb diggers which in some cases may be to the point, but in others contain exaggeration. Thus they enjoin that in cutting some roots one should stand to windward, and that one should first anoint oneself with oil, for that one's body will

swell up if one stands the other way. Also that the fruit of the wild rose must be gathered standing to windward, since otherwise there is danger to the eyes. Also that some roots should be gathered at night, others by day and some before the sun strikes on them." Such precautions as are mentioned here may seem foolish and may have been first devised with the intent of discouraging many people from adopting such a dangerous profession. On the other hand, later writers have suggested that since some plants are able to produce unpleasant skin irritations upon touching them, that hands and arms coated with oil might have offered much the same protection as gloves do to the modern botanist who wishes to study poison ivy. And now, that we know something about allergies perhaps it was good advice to instruct sensitive folks where to stand when they plucked the fruit of the wild rose, lest they suffer the discomforts of rose fever.

Theophrastus continues to relate: "These and similar remarks may well seem to be not off the point, for the properties of these plants are hurtful; they take hold, it is said, like fire and burn; for hellebore too soon makes the head heavy, and men cannot go on digging it up for long; wherefore they first eat garlic and take a draught of neat wine therewith. On the other hand the following ideas may be considered farfetched and irrelevant; for instance, they say that the peony should be dug at night, for, if a man does it in the day-time and is observed by a woodpecker while he is gathering the fruit, he risks the loss of his eyesight; and, if he is cutting the root at the time he gets prolapsus ani.

"It is also said that, while cutting feverwort one must beware of the buzzard-hawk, if one wishes to come off unhurt; and other reasons for caution are also given. That one should be bidden to pray while cutting is not perhaps unreasonable, but the additions made to this injunction are absurd; for instance as to cutting all-heal; for then it is said that one should put in the ground in its place an offering made of all kinds of fruits and cake; and that, when one is cutting gladwyn, one should put in its place to pay for it cakes of meal from spring-sown wheat, and that one should cut it with a two-edged sword, first making a circle around it three times, and that the piece first cut must be held up in the air while the rest is being cut.

"And many similar notions are mentioned. Thus it is said that one should draw three circles round mandrake with a sword and cut it with one's face towards the west; and at the cutting of the second piece one should dance round the plant and say as many things as possible about the mysteries of love. One should also, it is said, draw a circle round the black hellebore and cut it standing towards the east and saying prayers, and one should look out for an eagle both on the right and on the left, for there is danger to those that cut, if your eagle should come near, that they may die within the year. These notions then seem to be irrelevant, as has been said. There are however no methods of root-cutting besides those which we have mentioned."

These Rhizotomi fashioned about all the botany and pharmacy that existed until the time of the Greeks. In the western world botany as a branch of natural philosophy owed its inception to the finest period of Greek culture. Among the earlier Greek philosophers who concerned themselves with plants we may mention Hippocrates, Aristotle and Theophrastus. These philosophers considered plants and studied them with a different point of view than had existed previously. Agnes Arber[1] discussing this aspect says, "From the beginning the study of plants has been approached from two widely separated standpoints—the philosophical and the utilitarian. Regarded from the first point of view, botany stands upon its own merits as an integral branch of natural philosophy, whereas, from the second it is merely a by-product of medicine and agriculture. At different periods in the evolution of the science, one or the other aspect has predominated. but from classical times onwards, it is possible to trace the development of these two distinct lines of inquiry, which have at happy moments converged, though they have more often to their detriment, followed unconnected routes."

Hippocrates, father of medicine, born 460 B. C., lists 240 plants used in medicine. These are mentioned for their medicinal properties rather than for their botanical interest.**

Aristotle (384-323) B. C. was a student of Plato but seems to have excelled his master in his interest and contributions to natural science. Aristotle was a tutor of Alexander the

**The number of plants known and recommended for medicinal use by Hippocrates differs according to the writings thought to be of Hippocratic origin. See Kremers-Urdang, History of Pharmacy, Philadelphia, 1940, p. 11. G. Urdang.

Great and this close acquaintanceship with the Hitler of his day has had a profound influence on the subsequent development of plant knowledge. Aristotle owned a garden in which he taught his peculiar philosophical doctrines and in which he grew many plants, some of them foreign to the soil of Greece. It is said that many of these plants were sent to Aristotle by the soldiers of Alexander's far flung army. It was the first botanical garden and was important because it offered the first opportunity to contrast plants in any sort of a scientific manner. Most of Aristotle's contributions to our knowledge of plants have been lost and such remnants as do remain are of little real value.

Theophrastus was a student of Aristotle's and so deeply was the pupil loved by the master that at the time of Aristotle's death the botanical garden was transferred to Theophrastus. The latter enlarged it and added to the number of plants that it contained so that at last it was truly representative of the flora of the Mediterranean basin. Theophrastus was born 371 B. C. He is considered to be the father of botany. Edward Lee Greene[2] has written an eulogy on Theophrastus in which he outlines the contributions that this Greek philosopher has made to botany and to all plant sciences in general.

These contributions may be summarized here as follows using Greene's recapitulation:

1. Distinguished the external organs of plants naming and discussing them in regular sequence from root to fruit.
2. He classified plant organs as permanent and transient.
3. Discovery that aerial roots were roots and thus different from tendrils.
4. Distinguished between roots and underground stems.
5. Distinguished between trunk, stalk, and culm.
6. Regarded the flower as a metamorphosed leafy branch.
7. Divided the plant world into the two subkingdoms of the flowering and flowerless.
8. The flowering group he divided again into the petaliferous and apetalous.
9. He indicated the important differences of the hypogynous, perigynous and epigynous insertion of corolla and stamens.
10. Distinguished between centripetal and centrifugal inflorescences.
11. First used the term "fruit" in a technical sense and introduced the term "pericarp."
12. Classified all seed plants as angiospermous and gymnospermous.

13. On the basis of duration he classified plants as tree, shrub, half-shrub, and herb.
14. He observed many of the differences in the structure of stems, leaves and seeds by which later botanists distinguished between monocotyledonous and dicotyledonous plants.
15. He described the difference between the excrescent and deliquescent types of tree development.
16. He knew how annual rings in stems were formed.
17. With unaided vision he was able to distinguish between parenchymatous and prosenchymatous tissues.
18. He made the first recorded ecological observations relating plants to each other as a society and to their environment in general.

Truly this is a list of achievements that cannot be credited to any modern botanist. This many "firsts" should entitle any man to the distinction of "father of botany." However, Greene observes that some of these observations were made by little-famed predecessors of Theophrastus whose works have been lost. Some of their achievements have been perpetuated for us by mention in the works of Theophrastus.

The name of Theophrastus has been perpetuated for us by the naming of a plant species—Abutilon theophrasti—the velvet weed. Meyer has said, "If history be a connected succession of events, botany from Theophrastus forward to the sixteenth century has no history." In this interval much was written by many men concerning plants but these writers were not botanists after the order of Theophrastus, but writers on medical, agricultural and horticultural botany.

Of this latter group one great name appears, a name familiar to all pharmacists—Pedanios Dioscorides. The date of birth is not known with certainty although it occurred in the first century of our era. Dioscorides was a Cilician Greek educated as a physician and one who practiced medicine. He was also a great traveler for his day and the study of plants seemed to be the principal objective of his travels. While mainly interested in plants having known medicinal values he did not necessarily confine his attentions to such plants. When he described a plant he described the entire plant, root, stem, leaf, flower and fruit and his descriptions are lucid and complete. He lists six hundred plants, an increase of one hundred since the days of Theophrastus three hundred years before. It is of interest in this connection that Dr. Merrill of Harvard in a recent address[3] estimated that the number of plants known today approximate one million species.

Most of the original manuscripts concerning plants written by Dioscorides have been lost. But so important was his writings considered by early plant scientists and the medical profession of the early centuries that innumerable transcriptions, translations and revisions of the works of Dioscorides are in existence.

Although centuries apart, Theophrastus and Dioscorides are considered together here because of the profound influence that these two men exerted over the succeeding centuries and their influence cannot be too much discounted even today. Greene says of Dioscorides, "If to have written the most practical serviceable book of botany that the world of learning knew during sixteen centuries were the best title to botanical greatness, to Dioscorides would readily be conceded the absolute supremacy over all other botanists, not only of antiquity but of all time."

Sprengel says of Dioscorides, "During more than sixteen centuries he was looked up to as the sole authority, so that everything botanical began with him. Everyone who undertook the study of botany, or the identification of medicines swore by his words. Even as late as the beginning of the seventeenth century both the academic and private study of botany may almost be said to have begun and ended with the text of Dioscorides."

It is regretted that the scientific learning of the succeeding sixteen centuries should have depended so asbolutely on the works of these old masters as excellent as that work was, rather than upon research. Progress is stultified when science is dependent upon authority rather than upon individual initiative.

A man who lived in the second century B. C. and therefore closer to Theophrastus than was Dioscorides was Nicander of Colophon. While this man and his works wielded no profound influence over succeeding generations they are of interest to this presentation. Nicander was a Greek grammarian and poet. He was also a naturalist and learned in the pharmacy and toxicology of his day. He expressed himself in poetic measure. One poem, the Alexipharmica, was a treatise that concerned itself with poisons and their antidotes. This poem consisted of 630 verses discussing 21 different poisons, of which two are mineral, eight animal, and eleven veg-

etable products. Most of the remedies for these poisons are vegetable. The symptoms described are true to modern experience but the plants mentioned are poorly described.

The "Theriaca" was a more ambitious work of 958 verses. The poem concerns itself with poisonous animals and methods of overcoming injuries by such animals. There is a preliminary discussion on methods of frightening away poisonous animals or keeping them aloof. I don't know whether he included a method for keeping the wolf from the door; if so, this work might be restored for the benefit of income tax payers. He did include discussions of the bites and stings of insects and apparently described these quite faithfully. Most of the remedies for these insect attacks were vegetable in nature but again, his plant descriptions are hazy and inexact.

The Romans did not create any botanical masterpieces. They were more interested in conquest and in ruling their conquered territories than they were in advancing the sciences so well begun by the Greeks.

The golden age of Greek learning ended with the disintegration of the empire of Alexander. Greek knowledge became the inheritance of the nations located at the eastern end of the Mediterranean but these nations made few contributions to new learning. The Arabs did perform a service to botanical knowledge that should not be ignored. They made many exact copies of learned manuscripts then in existence and in this manner kept Greek botanical knowledge alive through the medieval period.

The dark ages were well named as far as knowledge about plants was concerned but these ages following the first century were not a total loss. Men continued to get sick and were continually demanding cures for their ailments. The drug gatherers continued to seek for healing herbs and roots of medicinal value. For the most part they adhered closely to those plants that tradition had taught them to be of value but occasionally a new plant was discovered and described. These additions to the known flora were not many over a short space of time but they had a tendency to accumulate over a series of years. At infrequent periods an herb gatherer with more literary ability than his fellows would seek by description and illustration to preserve a record of known plants and this also might be of service to the medical pro-

fession. Thus, that group of botanical manuscripts known as herbals had their origin, and for a thousand years herbals were the only existing writings that concerned themselves with plants. No discussion of the early botanists to pharmaceutical botany would be complete without a brief consideration of the more important herbalists.

An herbal has been defined as "a book containing the names and descriptions of herbs, or plants in general with their properties and virtues." The very earliest herbalists made use of such terms as "hortus" or "gart" in which use is is made of the analogy of a garden. For instance Olorinus in a book about "wonder trees" describes them as having been transported from the great world garden into "this little paper gardenlet.". The word "hortus" has had a modern rebirth in "Hortus: a concise dictionary of gardening" authored by Liberty Hyde Bailey and published by Macmillan.

Among the first of the printed works to which the term "herbal" is applied is a treatise in Latin by Apuleius Platonicus. His herbal is an illustrated medical recipe book. This book was probably written in Greek in the fifth century. It is thought to have had a career of a thousand years in manuscript before it appeared in print in Rome.

The introduction of printing into Europe made possible the rapid multiplication of books on botanical subjects and greatly increased learning concerning plants. It had the same stimulus to botany that it had to the other sciences, and to learning in general.

Soon after the appearance in Italy of the Herbarium of Apuleius Platonicus, three herbals of considerable merit were printed at Mainz, Germany. These were the Latin Herbarius of 1484. The German Herbarius of 1485 and the Hortus or Ortus sanitatis of 1491. These works are largely important because much of what they contained was copied and used as the foundation of later herbals. It seems that at the time these books were printed there were no copyright laws and as soon as a popular book appeared much of its material was pirated by other authors. In many instances the material degenerated in style and accuracy with each succeeding piracy. These earlier herbals mixed trustworthy facts indiscriminately with weird flights of fancy.

The herbarium of Apuleius was the first to acquaint the English with the herbal medicine of Southern Europe. In this as in most of the earlier works, plants were regarded as "simples"—that is, as the simple constituents of compound medicines. Agnes Arber[1] says concerning this word now so strange in our language. "The word 'simple' was a household word at a time when most remedies were manufactured at home or in the stillroom. Although the word 'simple' has vanished from our talk, its antithesis 'compound' has held its place in the language of pharmacy, and to some extent in our common speech."

We have mentioned the cautions that Theophrastus recorded as being necessary when digging the mandrake. Apuleius also considered that the digging of this root should not be undertaken without careful preparations as follows: "This wort is mickle and illustrious of aspect and it is beneficial. Thou shalt in this manner take it, when thou comest to it, then thou understandest it by this, that it shineth at night altogether like a lamp. When first thou seest its head, then inscribe thou it instantly with iron, lest it fly from thee; its virtue is so mickle and so famous, that it will immediately flee from an unclean man, when he cometh to it; hence do thou inscribe it with iron, and so shalt thou delve about it, as that thou touch it not with the iron, but thou shalt earnestly with an ivory staff delve the earth. And when thou seest its hands and its feet, then tie thou it up. Then take the other end and tie it to a dog's neck, so that the hound be hungry; next cast meat before him, so that he may not reach it, except he jerk up the wort with him. Therefore, as soon as thou see that it is jerked up, and have possession of it, take it immediately in hand, and twist it, and wring the ooze out of its leaves into a glass ampulla."

One of the earliest herbals printed in English is credited to Richard Bancke about 1525. A quotation from this book concerning the virtues of the herb, rosemary will give some idea of the character of the book and of herbals in general of that period. "Take the flowers and make powder thereof and bind it to the right arm in a linen cloth, and it will make thee light and merry. Also take the flowers and put them in a chest among your clothes or among books and moths shall not hurt them. Also boil the leaves in white wine and wash thy face therewith, thou shall have a fair face. Also put the

leaves under thy bed head and thou shall be delivered of evil dreams. Also make a box of the wood and smell it and it shall preserve thy youth. Also put it in thy doors or in thy house and thou shall be without danger of adders and other venomous serpents. Also make a barrel of it and drink it and thou need fear no poison." Bancke's book was very popular and ran through many editions.

The highest reputation for early English herbals goes to the "Great Herbal." It was printed first by Peter Treveris in 1526. It laid no claim to originality but quite frankly was a compilation of material from earlier books. A number of medicines enumerated in the "Great Herbal" are familiar to us today. Liquorice and horehound are recommended for coughs; laudanum, herbane, opium, and lettuce as narcotics; olive oil and slaked lime for scalds; and borax and rose water for the complexion. One is told how to make a ptysan of barley-water; how to gargle the throat, how to distinguish good from inferior musk. The reader is given recipes for forgetfulness and fears; for hair dyes and stains for the nails. The author exposes those who fake drugs and attempts to discourage fraud among the sellers of drugs. This is perhaps the first break to appear in the ancient idea that drug making and selling was a mysterious and dangerous art and that the public must be kept unenlightened concerning the mysteries. At the conclusion of the "Great Herbal" are written these words: "O ye worthy readers or practitioners to whom this noble volume is present, I beseech you take intelligence and behold the works and operations of almighty God which hath endowed his simple creature mankind with the graces of the Holy Ghost to have perfect knowledge and understanding of the virtues of all manner of herbs and trees in this book comprehended."

The names of Brunfels, Bock, Fuchs, Cordus and Bauhin stand out in botanical literature as the Fathers of German botany. Sachs[7] in his history of botany points out that if we view these men by present standards we will be disappointed in their knowledge and scientific discernment, but if we judge them by the works of their predecessors they will stand out clearly as among the great leaders in the botanical field. These men were influenced by the writers of classical antiquity only so far as they attempted to identify the plants mentioned by Aristotle, Theophrastus, and the Greek school

of natural philosophers. These German fathers of botany brought to their labors not only an independence of thought but a wealth of accurate observation and description that could well be copied by our modern botanical scholars. These Germans were undoubtedly influenced by the strictly utilitarian aspect of their profession but they differed from the herbalists previously mentioned in this paper that they respected the plant for its own sake and in most instances a plant described by them could be identified by botanists working centuries later. These men therefore, not only performed a service to pharmacy by making the accurate identification of a drug plant, but to botany as well, in laying the foundations for taxonomic botany. Sachs states "The perception of a natural affinity among plants could only be obtained from exact description a thousand times repeated, never from the abstractions of the Aristotelian school which rested essentially on superficial observation."

Fuchs for whom the fuchia is named becomes quite indignant at the ignorance of herbs displayed by medical men. He expressed himself in this fashion—"But, by immortal God, is it to be wondered at that kings and princes do not at all regard the pursuit of the investigation of plants, when even the physicians of our time so shrink from it that it is scarcely possible to find one among a hundred who has an accurate knowledge of even so many as a few plants." Fuchs explains his own interest in plants—"But there is no reason why I should dilate at greater length upon the pleasantness and delight of acquiring knowledge of plants, since there is no one who does not know that there is nothing in life pleasanter and more delightful than to wander over woods, mountains, plains, garlanded and adorned with flowerlets and plants of various sorts, and most elegant to boot, and to gaze intently upon them. But it increases that pleasure and delight not a little, if there be added an acquaintance with the virtues and powers of these same plants."

Other continental herbalists who contributed much to descriptive botany were the following: Camerarius, Christophe Plantin of Antwerp, another Belgian, Rembert Dodoens, Charles de L'Ecluse, Mathias de L'Obel, Pierandrea Mattioli, an Italian; Fabius Columna and Conrad Gesner.

Returning to England we find that one of the greatest of the later English herbalists was William Turner, sometimes

spoken of as the father of English botany. Turner was a physician and a preacher as well as a botanist and his life was a turbulent one because he was a religious reformer and often found himself in trouble with the law. During these periods he was often an exile and his forced travels gave him a greater opportunity to study plants in foreign lands than would have been his lot had he led a more peaceful life. One of Turner's earliest contributions to botany was a work entitled, "The names of herbs in Greek, Latin, English, Dutch and French with the common names that herbalists and Apothecarys use." His chief work was his Herbal published in three parts; the first in London in 1551; the second in Cologne when he was absent from his country by request, and the last part in 1568. Turner possessed considerable independence of thought which is expressed in his writings. He dealt unmercifully with some of the old superstitions. For instance, we have referred to superstitions associated with the mandrake. Turner has this to say about the mandrake, "The roots which are counterfeited and made like little puppettes and mammettes, which come to sold in England in boxes with hair, and such form as a man hath, are nothing else but foolish feigned trifles, and not natural. For they are so trimmed by crafty thieves to mock the poor people with all, and to rob them both of their wit and their money." Although systematic botany in Great Britain is supposed to date from Turner he did not treat the plants mentioned in his herbal in any systematic manner but regarded his plants as individuals and arranged them alphabetically.

John Gerard, most famous of all English herbalists, was trained as a barber-surgeon although his interest in horticulture seems to have been greater than in the profession for which he was trained. Holborn was then a fashionable district in London and Gerard had a garden of such reputation in this district that it might be dignified with the name of "botanic garden." Gerard's principal contribution to botany was the "General History of Plants" published in 1597. This large book contained 1800 wood-cuts most of which had been pirated from earlier herbals. One of these pictures of the potato plant, was apparently original and the first figure of the plant known to have been published. Gerard was not a thorough-going scientist even for his day and did not discriminate as did Turner between facts and superstitions. The

story concerning the barnacle tree—a tree bearing geese, was almost as hoary and even less credible than the mandrake fables. Nevertheless, Gerard relates the story of the barnacle tree in his herbal but states that he never actually saw a tree that produced geese, but then proceeds to relate in detail his own observations of a tree that did not give rise to geese but to birds somewhat smaller in size. Gerard's book was the popular herbal in England for many years and was revised a number of times. One of these revisions was by Thomas Johnson. Johnson was also notable for his account of botanizing in England and Wales and is the earliest attempt to record all the plants in those portions of the British Isles.

John Parkinson was the last great British herbalist. He lived in the period of 1567 to 1650 and at one time had the title of Herbalist to Charles I.† Parkinson's fame as a botanist rests largely upon the publication of two books. The long title of his first book is an indication of its contents: "A garden of all sorts of pleasant flowers which our English air will permit to be nourished up together with the right ordering, planting and preserving of them and their uses." In this book he gave directions for the planting and cultivation of a garden together with an account of a large number of plants that were then under cultivation in England. This book was largely noted for its horticultural merit but a short time later he published a companion book on "simples" which was an herbal devoted chiefly to plants used in medicine. He is credited with the earliest accounts of the Welsh-poppy, the strawberry tree (Arbutus Unedo) and the ladies' slipper.

In the preceding review of herbals we have emphasized that their chief scientific merit was the illustration and description of many plants. The idea of pressing and preserving plants in a herbarium, a practice so common today was not a practice of the early herbalists. Herbaria in the sense of making collections of dried and pressed plants were apparently introduced in the sixteenth century by an Italian, Luca Ghini. From the time of Ghini to the present, pressed plants representing the types described has been a practice of immense service in the accurate determination and comparison of species.

†Thomas Johnson as well as John Parkinson were apothecaries.—G. Urdang.

A doctrine totally lacking in scientific merit but which occupied much of the attention of the medieval bontanists was that of "signatures." According to this doctrine many herbs are stamped with the indication of their uses. Quoting from an early work on this subject "I have oft-times declared, how by the outward shapes and qualities of things we may know their inward virtues, which God hath put in them for the good of man. So in St. John's wort, we may take notice of the form of the leaves and flowers, the porosity of the leaves, the veins. 1. The porosities or holes in the leaves, signify to us that the herb helps both inward and outward holes or cuts in the skin. 2. The flowers in Saint John's wort, when they are putrified, they are like blood; which teacheth us that this herb is good for wounds, to close them and fill them up."

Other examples of this doctrine follow: Long-lived plants will lengthen a man's life, while short-lived plants would abbreviate it. Herbs with yellow sap can cure jaundice. Herbs, whose surface was rough to the skin would cure those diseases that might affect the smoothness of the skin. Plants with flowers shaped like butterflies would cure insect stings. Those plants whose roots or fruits suggested a jointed appearance would be a remedy for the sting of a scorpion. Baldness could be cured by the maidenhair fern because the delicate stalks of this fern suggested human hair. Plants with heart-shaped leaves should be able to heal diseases of the heart. William Cole in 1657 expounded this theory as it related to the walnut. "Walnuts have the perfect signature of the head: The outer husk or green covering represent the pericranium or outward skin of the skull, whereon the hair groweth and therefore salt made of those husks or barks, are exceedingly good for wounds of the head. The inner woody shell has the signature of the skull, and the little yellow skin, or peel, that covereth the kernel of the hard meninga and piamater which are thin scarfs that envelope the brain. The kernel hath the very figure of the brain and therefore it is profitable for the brain and resists poisons; for if the kernel be bruised and moistened with the quintessence of wine, and laid upon the crown of the head, it comforts the head and brain mightily."

An interesting adherent to the doctrine of signatures was Theophrastus Bombast von Hohenheim. He was a physician who later became a professor at Basle. In his professorship

he gave offence by interpreting his own works in preference to those of the Ancients. Contrasting himself with Galen he remarked "I shall be the monarch and *mine* shall the monarchy be." He was considered a quack by his contemporaries, but he is famous for giving to our language the very practical word "bombast."‡

The doctrine of signatures had no scientific value as such but it was an added incentive to the study of plants in order to try to discover a sign to indicate their value. Botany was thus advanced by a false doctrine. Pharmacy likewise was benefited by the doctrine of signatures since many plants were experimented with for their medicinal value for no other reason than that they were thought to have a favorable sign.

The golden age for the herbalists was the 15th and 16th centuries. The last of them appeared in the 17th century. The herbalists were gradually replaced by botanists of a different sort. They were replaced by those who created systematic botany; and by those who tore plants to pieces to determine how they were constructed, and thus laid the foundations for plant anatomy. But had it not been for the describers and portrayers of plants, taxonomy, anatomy, and physiology could not have been developed. The immense number of plants described by the herbalists had accumulated over the preceding three centuries. This accumulation made some sort of an orderly arrangement of the material absolutely necessary. Thus, systematic botany was born, a legitimate heir to the botanical studies of the previous generations.

Linnaeus is quite apt to be considered the first systematist since botanical nomenclature is base lined with his Species Plantarum of 1753. Linnaeus was not the first in his field. He was preceded by able men and borrowed many of his ideas of classification from them. Cesalpino, one of the earliest of these predecessors, published his principal work in 1583. Sachs[7] says of Cesalpino "He was much before his time in his mode of contemplating the vegetable kingdom, seeking always

‡Modern historians see in Parcelsus one of the most important reformers of medicine. Undoubtedly he has to be given credit for the introduction of chemicals into internal therapy, as to the word "bombast" E. H. Sigerist (Bull. Hist. Med. 10: 688, 1941) states: The word bombastic has nothing to do with Paracelsus. Paracelsus' family name was Bombast von Hohenheim. Since his style is rather involved and his writings present serious difficulties of interpretation, many people assumed that the word bombastic was derived from the proper name Bombast and was used to designate a peculiar style similar to that of Paracelsus. See Oxford Dict. which gives history of the word.—Urdang.

for philosophical combinations and comprehensive points of view." This viewpoint that Cesalpino had in contrast to his contemporaries is seen in this quotation from his own works—"We seek out similarities and dissimilarities of form, in which the essence of plants consist, but not of things which are merely accidents of them. Medicinal virtues and other useful qualities are just such accidents." Scientific arrangement must proceed along this path if it is to exhibit real affinities. Others who preceded Linnaeus and who created a basis for his work were Jung (1587-1657), Robert Morison (1620-1683), John Ray (1628-1705) and Tournefort (1656-1708).

Carl Linnaeus was born near Rashult, Sweden, in 1707. Peattie[5] says of this birth "No one surely expected the greatest naturalist of the age to come out of Sweden. When continental Europe thought of that peninsular country at all, it was as a big icicle hanging from the eaves of the north pole." The father of Linnaeus was a minister having originally been named Nils Ingemarsson, that is, Nils the son of Ingemar. Nils had received permission to select a family name and took in a prophetic moment the name "linn" or Linnaeus after a much admired linden tree that grew in the yard.

Young Carl Linaeus seems to have been interested in plants almost from his birth. Nils, himself a lover of flowers, could keep the infant Carl in good behavior by putting him on the grass with a flower in his hand at which he would gaze rapturously for hours. At a very early age Linnaeus could name all the flowers in the rectory garden. He began the study of medicine but his heart was not in medical studies. In 1730 Linnaeus made his first botanical journey to Lapland and this was the forerunner of other botanical explorations to various parts of the world. His death occurred in 1777. Author of many works his most noted were the Species Plantarum and the Genera Plantarum. In these two books he laid the foundations for binomial nomenclature and the modern system of plant classification. Linnaeus did not invent the idea of bilnomial nomenclature but he selected it from among the several systems of the past and adhered to it alone as the best system for plant nomenclature. Linnaeus marks the end of an age of groping in the dark for botanical facts and made it possible by proper systemization to grasp the world of plant nature as a united and a related whole.

Some workers in fields of applied botany often fail to evaluate properly the contribution made by taxonomy to their particular area of interest. There was a time not so long ago when the study of botany consisted almost solely of the collection and classification of plants. Once the plant had been named and properly pigeon-holed, this school of botanists had no further interest in it. The pendulum now swings in the opposite direction and systematic botany is neglected. The applied lines are over emphasized and many now think that an interest in a plant for its own sake is unworthy. It is possible for an individual now to get a Doctor's degree in botany in some institutions without becoming at all acquainted with the local flora. Taxonomy is the mother of botany. Physiology, pathology or any of the more applied phases of the subject lose much of their meaning if taxonomy be neglected. To determine whether a plant be edible or poisonous it must be recognized and that recognition is based upon its botanical characteristics. A knowledge of plant relationships will also reveal substitutes if the original plant is unavailable.

Referring once more to Dr. Merrill's address[3]: Dr. Merrill spent considerable time in the Philippines studying the effects of the oil of the Chaulmoogra tree on the treatment of leprosy. He stated that the reason why chaulmoogra oil was not always effective was that it was often taken from species of trees that produced a very inferior product. On the other hand, there were species of this plant that had not been used until the experiments of Merrill revealed that these ignored species yielded an oil of high potency. One of these neglected species was discovered inside the ground of one of the Philippine leper colonies. Dr. Merrill used this as an illustration of the necessity of knowing plant relationships. The present panic that prevails in an effort to find plants that will yield a rubber latex also illustrates the importance of knowing such relationships.

The title presented to me as a basis for my remarks this afternoon was "Contributions of early botanists to pharmaceutical knowledge." When you consider that botany began as a search for plants that could provide food, shelter, and medicine, my topic could well be worded in reverse, as follows: "The contributions of pharmacists to botanical knowledge." This thesis has had ample verification in my remarks. I can give you two modern reasons for the reversed title.

Lloyd brothers of Cincinnati were manufacturing pharmacists. They became interested in botany; particularly in the woody fungi and before their death established the best collection of the woody fungi to be found any place in the world. They named many new species, revised the names of old ones and became the leading authorities in this field of Mycology. Their botanical library was also one of the outstanding botanical libraries of the world.

Charles Deam was engaged in the drug business in Bluffton, Indiana, before he became interested in plants. He desired to know more about the plants whose products he used. Today, Charles Deam has a world wide reputation as a botanical scholar. For many years he was state forester. He has made contributions to botanical knowledge in the form of books describing the flora of the State of Indiana.

Science has many facets but all of its phases seek to give a more adequate interpretation of life. The errors and faulty observations of one group has delayed progress not only of itself but of other groups allied with it. Likewise contributions to knowledge in any field has accelerated the progress of all fields.

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A History of the Louisville College of Pharmacy*

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I. *Its Beginning and Organization*

The sequence of events which led to the inception of the Louisville College of Pharmacy really began in the year 1848, when Louis Philippe of France was deposed by the revolution of February of that year and the spirit of unrest and the turmoil in Europe involved Austria and the German states. Many sympathizers with the revolution were compelled to flee when the reaction of 1849 developed. Among these refugees were the Scheffers of Stuttgart, and the Diehls of Neustadt in Rhenish Bavaria—Scheffer and Diehl—two names that became prominent in American pharmacy and in the founding of the Louisville (Ky.) College of Pharmacy.

Emil Scheffer was born in Stuttgart, the capital city of Wurtemburg, July 7, 1821—the youngest of seven children born to Carl Ludwig Frederick Scheffer and Marie Maurer. The father died at the age of forty-four, when Emil was only two and a half years old. Emil attended schools at Stuttgart until 1829, then at Boeblingen until 1835, then went back to Stuttgart to attend the Polytechnic School. That same year, 1835, he selected pharmacy as his vocation and was apprenticed to an apothecary in Tuebingen. He completed his apprenticeship in 1840 and passed his examinations, was employed for two years in Constance, and in Zurich for a similar period of time, followed by shorter periods of employment in Frankfort-On-The-Main and in Mannheim, on the Rhine. He returned to Stuttgart in the spring of 1845 to again attend the Polytechnic School, from which in the fall of the same year, he entered the University of Tuebingen. Here he sat in the classrooms of some eminent German scientists among them Gmelin, whose assistant he became after passing his "State Examination."[1] He continued as Gmelin's

*Read before the Seminar of the American Institute for the History of Pharmacy at Purdue University, July, 1942.

[1]C. L. Diehl, in his biography of E. Scheffer published in Am. J. Pharm. 74: 209, 1902, confounds Christian Gottlob Gmelin (1792-1860), who taught chemistry and pharmacy at the University of Tuebingen and was the teacher of E. Scheffer, with the famous author of "Gmelin's Chemistry," Leopold Gmelin (1788-1853) who was professor of medicine, pharmacy and chemistry at the University of Heidelberg. Urdang.

assistant until just before coming to the United States in 1849.

Emil Scheffer's first employment in the United States was with Charles Schmitt in Cincinnati, Ohio, where his outstanding ability attracted much favorable notice and led to his coming to Louisville, Kentucky, in 1850, as manager of the drug store of Mrs. Olivia (Beckham) Kneiss, widow of Frederick Wm. Kneiss. Scheffer and Mrs. Kneiss were married Jan. 20, 1852.[2] The drug store was located on Market Street between Floyd and Preston Streets and was a model for neatness and equipment. In a separate building at the rear, much of his laboratory work was done, including his work on pepsin which was later to give him international recognition. The store was discontinued in 1862, but he continued for several years to make pepsin and lactated pepsin at a location on Wenzel and Washington Streets. Emil Scheffer was an excellent chemist and botanist, and taught botany and materia medica at the Louisville College of Pharmacy for several years.[3]

C. Lewis Diehl was born at Newstadt in the Palatinate (Rhenish Bavaria) on August 3, 1840, where his father was an official in the judiciary department of the Bavarian government. The father became involved in the revolution of 1848-49 and had to flee to France, from a sentence to death by Bavarian courts. The father emigrated to the United States, settling in Illinois where the wife and six children attended the public schools in Bellville, Illinois, and the Oakfield Academy near St. Louis, Missouri. The family moved to Philadelphia, then to Buffalo, then to Chicago. In 1854, C. Lewis "secured a situation with R. and G. A. Wright, Perfumers (Druggist's Sundryman)"[3], Philadelphia, worked there until 1857, then joined his father in Chicago. In 1858 he returned to Philadelphia and became apprenticed to Dr. John R. Angney, during which apprenticeship he attended lectures at the Philadelphia College of Pharmacy, graduating in 1862.

After working for a time with Mr. Emilius Herwig, and John Wyeth and Bro., C. L. Diehl enlisted in August 1862, in the 15th Pennsylvania Cavalry, joined the Army of the Cum-

[2]In the Louisville City Directory for 1852, Emil Scheffer is listed as a clerk for Mrs. Kneiss.

[3]For a more extended biography see the article of C. L. Diehl in Am. J. Pharm., 74:209, 1902.

[4]Midland Drugg. and Pharm. Review, 44:499, 1910.

berland and received facial wounds in the battle of Stone River (Murfreesboro) December 31, 1862.

After release from the hospital, he rejoined his father in Chicago, and after a short interval he went to the United States Army laboratory in Philadelphia where he was assistant to Professor J. M. Maisch who was chief chemist. After several other moves he accepted in July 1865 an offer of Dr. J. Lawrence Smith to reorganize and manage the Louisville Chemical Works at Louisville, Kentucky. These Works had been established in 1857 by Dr. J. Lawrence Smith and Dr. Edward R. Squibb.

About June 1869, Diehl again turned to retail pharmacy, purchasing a store at First and Walnut Streets in Louisville, later removing to Third Street and Broadway where he enjoyed a lucrative practice and was widely known for his many attainments. He became a member of the American Pharmaceutical Association in 1863. He assisted in the organization of the Louisville College of Pharmacy in 1870 and was is president during its first ten years, was professor of pharmacy from 1871 to 1886, except during the sessions 1881-2 and 1882-3 when incapacitated by illness and again from 1896 until 1912.[5]

These two men, meeting for the first time in Louisville, were the prime factors in the establishing of the Louisville College of Pharmacy on August 16, 1870. The name "Louisville College of Pharmacy" was finally adopted although the name "Cities of the Falls College of Pharmacy" was also proposed.[6] At the organization, the election of officers resulted as follows:

C. Lewis Diehl, President
B. F. Scribner and George A. Newman, Vice Presidents
Fred C. Miller, Recording Secretary
Louis Eichrody, Corresponding Secretary
Geo. H. Cary, Treasurer
J. A. McAfee, Curator

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[5]For a more complete biographical sketch. see: Alumni Report of the Phil. Col. Pharm., 33: 201 (Oct. 1898) and the autobiographical sketch in Midland Drugg. and Pharm. Review 44: 499, 1910.

[6]From personal reminiscences with Professor Diehl the Constitution, By-Laws, and Code of Ethics of the Philadelphia College of Pharmacy were used as a model, and with only such changes as were necessitated by Kentucky laws, were read, not adopted.—C. L. C.

Dr. Thos. E. Jenkins, Mr. S. F. Dawes, Mr. Dan B. Grable, Ferd. J. Pfingst, and John Colgan were elected trustees, thus completing a group of twelve.

A committee on By-Laws and Code of Ethics was composed of Dr. Thos. E. Jenkins and Geo. H. Cary of Louisville, and B. F. Shribner of New Albany, Indiana. On motion, the chair appointed Messrs. Geo. A. Newman, J. M. Krim, and Jas. E. Brown as a committee to procure a charter for the college. It was also adopted that the sum of three dollars be fixed as a membership fee.

At a special meeting of the trustees, held in the office of Mr. George H. Cary on August 23, 1870, a committee was appointed to secure a room for the meetings of the college. At this same meeting by-laws were read by Chairman Jenkins, and were adopted as read. A committee on the "Progress of Pharmacy" consisting of Messrs. B. F. Scribner, Thos. E. Jenkins, Emil Scheffer, and Graham Wilder, was appointed with instructions to report all progress in pharmacy, materia medica, chemistry and its allied branches, at each pharmaceutical meeting, and annually to the meeting of the college. Two journals each, in English, French and German, were ordered purchased for the use of this committee.

A meeting was held in September 1870, and will be referred to later in this paper. On December 20, 1870, the meeting of the trustees was held in the rooms of the public school board of Louisville, at Center and Walnut Streets, as were also the meetings of January, February and March, 1871. At the December 20, 1870, meeting a committee was appointed to confer with the Physicians' Protective Association of Louisville, with instructions to request reciprocal reports on unethical practices of members of either body. At the February 1871 meeting it was agreed to start an employment register for those seeking pharmaceutical as well as for pharmacists seeking empolyees.

A Professor Coleman (probably N. W. Coleman, a teacher at Rev. John Atkinson's seminary), was requested to deliver a lecture on chemistry at some pharmaceutical meeting of the college, the date to be published in the daily newspaper.

It seems that the room at the school board's building was not suitable for the meetings of the college, and after con-

sidering a room at the Fifth Street Y.M.C.A., it was finally decided to rent two rooms on Third Street near Walnut, in the H. Preston Pope building through Dr. Satterwhite as agent, for $200.00 per year. The first meeting in that building was held on July 31, 1871.

The first annual meeting of the Louisville College of Pharmacy was held in "College Hall" on August 8, 1871, with twenty-one members present. The election resulted in selection of the following officers and trustees:

C. Lewis Diehl, President
B. F. Scribner and John Colgan, Vice Presidents
Fred C. Miller, Recording Secretary
Emil Scheffer, Corresponding Secretary
S. Fisher Dawes, Treasurer
J. A. McAfee, Curator[7]

Wm. G. Schmidt, Ferd J. Pfingst, D. B. Grable, Geo. A. Newman and Thos. E. Jenkins were elected trustees.

In the president's address was a recommendation to open a school of pharmacy. In fact, this was the original objective of the formation of the college as is noted in the following abstract from the committee report of September, 1870:

"It is eminently proper that we furnish the young men, who wish to enter our profession, the means of obtaining a theoretical and practical knowledge of the science and art of pharmacy by establishing a thoroughly organized school of pharmacy with efficient professors to teach the theory and practice of pharmacy, materia medica, chemistry and the collateral branches, as soon as possible. In the meantime, the college will hold monthly pharmaceutical meetings at which all subjects of interest to pharmacy will be discussed. . . It is the intention of the college to issue a journal of pharmacy at the earliest day practical." This committee report was signed by C. Lewis Diehl and Fred C. Miller.

Following the annual meeting of the college on August 8, 1871, a meeting of the new board of trustees was held Monday, August 14, 1871, at which meeting the president, C. Lewis Diehl, appointed the following committee:

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[7]Messrs. Colgan and McAfee were later manufacturers of the famous "Colgan's Taffy-Tolu Chewing Gum," made in the rear of a store at Tenth and Walnut Streets, Louisville.—G. L. C.

1. Committee on Charter: G. A. Newman, S. Fisher Dawes, and Ferd J. Pfingst
2. Committee on Progress of Pharmacy: Emil Scheffer, J. A. McAfee, and C. L. Diehl
3. Committee on Drug Market: Wm. G. Schmidt, John Colgan, and H. A. Pfingst
4. Committee on Pharmacopœia: Dr. Thos. E. Jenkins, B. F. Scribner, and C. L. Woodbury
5. Committee on Unofficial Formulæ: Fred C. Miller, Peter P. Sutton, and E. Kessler
6. Committee on Pharmaceutical Legislation: Emil Scheffer, S. Fisher Dawes, and W. W. Smith
7. Committee on Finance: John Colgan, Wm. G. Schmidt, and Dan B. Grable
8. Committee on Business: Ferd. J. Pfingst, Benj. F. Alford, and W. G. Dinwiddie
9. Committee on Rooms: S. Fisher Dawes, Fred C. Miller, and J. A. McAfee

On September 28, 1871, a meeting was held to discuss the beginning of a lecture course in a school of pharmacy for the coming winter. The matter was placed in the hands of a Lecture Committee consisting of Emil Scheffer, S. F. Dawes, Ferd J. Pfingst, and Fred C. Miller, with the authorization to solicit subscriptions of money, specimens, and apparatus as needed for use by the teaching staff of the school. The same month, the college sent Dr. Thos. E. Jenkins, Peter P. Sutton, and C. Lewis Diehl as its first delegates to the St. Louis, Missouri, convention of the American Pharmaceutical Association.

The faculty for the first teaching session was:

C. Lewis Diehl, Theory and Practice of Pharmacy
Dr. L. D. Kastenbine, Chemistry
Dr. Thos. E. Jenkins, Materia Medica

The introductory lecture was delivered by Dr Thos. E. Jenkins on Monday, November 13, 1871, at 7:30 p. m. The session thus inaugurated, was terminated during the first week of April, 1872.

It is interesting to note that in the college prospectus for the session 1872-73 was published "An alphabetical list of colleges of pharmacy in the United States whose diplomas are granted only when the student possesses, in addition to the theoretical or scientific knowledge acquired by study, a practical acquaintance with the apothecary business obtained by actual experience for several years previous to examination."

The colleges enumerated in this prospectus were:

1. Chicago College of Pharmacy
2. Cincinnati College of Pharmacy
3. Louisville College of Pharmacy
4. Maryland College of Pharmacy
5. Massachusetts College of Pharmacy
6. New York College of Pharmacy
7. Philadelphia College of Pharmacy
8. St. Louis College of Pharmacy

In the next prospectus the list was augmented by the additional listing of the colleges in San Francisco, California, Nashville, Tennessee, and the National College in Washington, D. C.

In 1872, when Dr. Thos. E. Jenkins resigned from the chair of materia medica, his chair was filled by Dr. Emil Scheffer, under whom botany was added to materia medica. For the session 1872-73, there were eighteen students enrolled, and six were graduated with the degree of Graduate in Pharmacy.

On Monday, February 10, 1873, Chairman S. F. Dawes of the Charter Committee reported that the charter for the college had been approved and passed by both houses of the Kentucky legislature on that date and on March 10, 1873, at a meeting of the college, a certified copy of the newly granted charter was read and adopted, whereupon the college proceeded to reorganize as a corporation under the terms of the charter. Twenty-two members were present, and upon balloting, the following were elected directors of the Louisville College of Pharmacy: Wm. G. Schmidt, John Colgan, Ferd J. Pfingst, Emil Scheffer, P. P. Sutton, F. C. Miller, C. Lewis Diehl, Vincent Davis, S. F. Dawes, J. A. McAfee, B. F. Alford, and E. N. Woodruff. Immediately after this meeting,

the board of directors met to organize and to elect its officers. The result of this election was:

C. Lewis Diehl, President
Emil Scheffer and Benjamin F. Alford, Vice Presidents
Fred C. Miller, Recording Secretary
Wm. G. Schmidt, Corresponding Secretary
S. Fisher Dawes, Treasurer
Curator, J. A. McAfee

In the president's address at the annual meeting March 10, 1874, the following excerpt is of historical interest: "At the meeting in August 1872, The Committee on Pharmaceutical Legislation was continued in order to effect the passage of a charter (creating the college—FDS) by legislative act. This committe was not discharged at the last annual meeting, and, as it was at that time agreed that an emergency existed for the creation of a law regulating pharmacy in this state, the board of directors instructed the aforesaid committee to prepare a draft of a law to be presented to the legislature, and, after its approval by the board of directors, to endeavor to secure its passage. You are doubtless aware that the committee succeeded in their endeavor and that the law so secured is now in force. The directors, who by the charter, are empowered to transact all business for the college, and were consequently empowered to nominate ten names, from which the governor is to select four members of the state board of pharmacy, have proposed simply to nominate ten names and submit them at this meeting for your approval."

The ten names submitted were: Emil Scheffer, High Preissler, Vincent Davis, Geo. H. Cary, John Colgan, Fred C. Miller, Wm. W. Smith, S. F. Dawes, Wm. G. Schmidt, and C. Lewis Diehl.

It seems that much opposition to the act developed, the principal objection being (1) that the law did not apply to the whole state, and (2) that the Louisville College of Pharmacy had acquired the right to nominate the majority of the Kentucky state board of pharmacy. President Diehl called attention to the fact that the experiences of other states had been the sole guide in framing the law, and that only in Rhode Island was there, at that time, a state-wide law.[8]

[8]There were at that time, i. e., in 1874, state-wide pharmacy laws in force in Alabama, Georgia, Rhode Island and Florida. See Kremers-Urdang, History of Pharmacy, p. 200.

To the second objection he observed: "The Louisville College of Pharmacy is, at present, the only organized association of pharmacists in the state. It is by no means exclusive in character, its aim being on the contrary, to unite the pharmacists not only of Louisville but of the entire state into one common brotherhood. . . . Furthermore, I believe that I can confidently assert that if at any time, other properly organized pharmaceutic associations should be established in this state, the Louisville College of Pharmacy will be among the first in the endeavor to place such associations on the same footing in relation to the appointments of the state board of pharmacy.

The American Pharmaceutical Association was to meet in Louisville in August of this year (1874), so Dr. Emil Scheffer was appointed local secretary and to assist him in his duties Messrs. Lee Beckham, J. A. McAfee, Wiley Rogers, H. A. Pfingst, and Ferdinand Lingelbach were appointed as a special committee.

Thus far, this brief account has dealt only with the conception, founding, and the first four years of the history of the Louisville College of Pharmacy. From this point on, the record is one of evolution and development which will be presented in a future installment. It is believed that the record of the formative years and the establishment of the incorporated (chartered) institution would be of first value from the historical viewpoint. Much biographical data has been omitted which eventually will be included in succeeding papers concerning the history of this institution.

Qualitative Chemistry and Qualitative Pharmaceutical Chemistry*

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The Fifth Edition (tentative) of The Pharmaceutical Syllabus lists qualitative pharmaceutical chemistry and qualitative chemistry as a required course in our colleges of phar-

*Read before the Conference of Teachers of Chemistry at the 1943 meeting at Columbus.

macy. It recommends that this course be given during the second year of college work and states that a minimum of 32 didactic hours and 96 laboratory hours (total 128 hours) be devoted to this particular subject.

For the purpose of this discussion let us consider the separate topics as outlined in this proposed course of study.

1. Definition. "The principles and practice of qualitative analysis as ordinarily given in the commonly used texts of that name and practical applications to pharmaceutical substances."

Today many of our colleges have adopted semi-micro qualitative analysis. It is generally acknowledged that semi-micro methods of analysis are in many ways superior to the macro methods of analysis. The time saving element alone is a factor that should recommend this newer method. Possibly the committee that prepared this outline assumed that the statement "as ordinarily given in the commonly used texts" was all inclusive. Would it not be well to clarify this, and definitely state that texts dealing with semi-micro methods of qualitative analysis may be used.

2. Objectives. "This course should be designed for students of pharmacy. It should be based upon the idea that the pharmacist should possess certain chemical skills and knowledge, including: 1, an understanding of the value and importance of qualitative chemistry in the compounding of prescriptions, 2, the ability to recognize incompatibilities in prescriptions, 3, the ability and knowledge of methods for the correction of incompatibilities and for the making of more ethical pharmaceutical preparations, and 4, an understanding of the relationship existing between crude drug constituents, chemicals, and pharmaceuticals used by the physician and pharmacist."

These are indeed laudable objectives but what "commonly used text" in qualitative analysis is based upon these objectives? Is this a course in pharmacy or is it essentially qualitative analysis? It is here we should attempt to train our students in careful manipulation and exact methods of procedure as a means for studying the general principles and theories on which the science of chemistry is based. The knowledge so acquired will enable the student to correctly in-

terpret the various tests found in the U.S.P., N.F., and other books of a pharmaceutical nature and teach him to recognize various chemical incompatibilities.

3. Prerequisites. "General chemistry and inorganic pharmaceutical chemistry.

This prerequisite automatically places qualitative chemistry after one year of college work. If a proper correlation could be arranged between general chemistry and qualitative chemistry, it would be entirely possible to present this course, beginning with the second semester of the first year. Such an arrangement could serve to the advantage of both subjects. At least such a plan might be worthy of further consideration.

4. General Considerations. "The following analysis of this course into more or less specific topics has been to show the method of presentation of subject matter as an aid to the student in completing the objectives set up for the course."

This statement would appear to indicate a "must" method of presenting the subject matter. The order and method of presentation should most certainly be left to the individual teacher. Content of a course, not methods of teaching, should be the objective of this outline.

5. Outline A. "The topics of each metal will follow this general outline with special emphasis on different phases of the subject:

Ions of the metals, their symbols and names
Occurrence of the elements
Physical and chemical properties and common name of the common salts used in medicine
Official salts of the U.S.P.
Complex ions
Special tests
Incompatibilities
Reactions which aid in the separation and identification of each element and radical
Scheme of analysis
Theoretical interpretations."

Would it not be better to say—the study of each metal should include the following—?

6. Outline B. "The student should be able to interpret, explain or answer the following on each element:

Know the official U.S.P. salts, their English name, chemical name, common name or synonym, chemical formula, and their general physical and chemical properties

Know the methods for the separation and identification of each element in the scheme of qualitative analysis

Be able to give the symbol of the ions, formula of a salt and name the salt of each element

Be able to complete and balance all chemical equations used in the scheme of qualitative analysis

Recognize and explain all the incompatibilities commonly met in compounding prescriptions using inorganic salts."

We are evidently given our choice of two outlines, A and B. Either one, if adequately presented as outlined, would require more than the 32 didactic hours alloted but we note later on in this outline that both A and B are required. A consideration of the general physical and chemical properties of the U.S.P. salts would involve several lectures. How about N.F. salts and non-official salts used in medicine? Why are they omitted?

What is meant by "Be able to give the symbol of the ions, formula of a salt, and name the salt for each element?"

Outline B requires the student "to balance *all* chemical equations used in the scheme of qualitative analysis" Equations are an important part of qualitative analysis but it is extremely doubtful if our students can balance *all* equations for all reactions. They should be able to complete and balance the equations representing important or typical reactions.

After this preliminary plan we approach the main outline of the course.

First we have the "Introduction" which is part of the didactic work. This includes:

"Technical terms, vocabulary, and definitions
Laws and theories
Degree of ionization
Ionization constant
Solubility constant
Common ion effect
Chemical equilibrium

Valence
Oxidation and reduction
Complex ions
Brief knowledge of hydrolysis
pH and its determination."

Without doubt nearly all of these laws and theories of chemistry should be presented by the time the student completes his course in qualitative analysis. The major exception is "pH and its determination" which might better be presented under the study of indicators in quantitative analysis.

Part two of the outline is entitled "Metal Analysis." Both didactic and laboratory instruction are required for the following metallic ions: silver, mercury. lead, bismuth, copper, arsenic, antimony, tin, aluminum, chromium, zinc, iron, manganese, calcium, barium, strontium, magnesium, sodium, potassium, and ammonium.

These metals are listed as "Group I—the hydrochloric acid group, *etc.*" Why this method of arrangement? Possibly some of us prefer to consider "Group 5" as Group I or again, we may wish to divide the metals into more than five groups. If the ions listed are all studied, does it make a great deal of difference how we group them for study?

We also note that certain specific topics are given under each metal. For example:

"Silver—Follow outline (A)

Photography and the part silver plays in it
Complex ions

The student should be able to
Explain or answer outline (B)
Give the chemical changes that take place in the exposure, developing, and printing of a picture."

Please remember this is a *must* for only one of the metals. There is no choice in the matter. The other metals follow the same general scheme and 32 hours are allowed for *all* of this material.

Part III of the outline is "Non-metals and Acid Analysis" with didactic and laboratory instruction both required. According to this outline the student should be able to—

"Discuss the separation and identification of chlorides, bromides, and iodides

> Give a specific test to prove the presence of each acid ion or radical
>
> Show by comparison how specific reactions for the metals can be used in acid analysis
>
> Compare the chemical behavior of each ion or radical showing how this knowledge can be used in a scheme of analysis
>
> Show how a knowledge of the reactions involved in the separation or identification of these ions or radicals is of value in the compounding of prescriptions."

Thirty-three acid ions or radicals are then listed for study. These are divided into seven groups and after a majority of these groups the following statement is made: "Characteristic identifying reactions of above ions and tests for purity of salts of same."

We must, according to the outline, discuss the separation and identification of chlorides, bromides, and iodides. Why not sulfates, thiosulfates, sulfites, and sulfides? Why not certain others that we might mention?

The division of the acid ions or radicals into seven groups is not the universal method of separation. Is it necessary to mention specific groups? Why not list the ions to be studied, giving the individual the privilege of considering them in any order that he may choose? Due to their importance, many of us study the acids prior to the consideration of the metals.

We will all agree that certain salts should be tested for identity and purity by official methods but to even suggest that salts of each acid should be so tested must be a typograhpical error.

This concludes the outline of study for qualitative analysis. Can you adequately present the course of study as outlined, in the minimum time allotted? Would it not be well to suggest that the committee reconsider this outline for qualitative analysis and formulate an outline that gives us a greater choice in presentation of subject matter with an amount of required material which can be adequately presented in the allotted time?

The Needs and Opportunities for Trained Pharmacognosists*

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Since the concern of pharmaceutical educators is primarily focused upon the training of students to meet the various needs of professional pharmacy and since pharmacognosy is one of the important professional subjects in the modern pharmaceutical curriculum, it is not strange that the question on the needs and opportunities for trained pharmacognosists has been scheduled for discussion at this conference. It is one in which every institution possessing the facilities for preparing students for positions in one or more fields of pharmacognosy is naturally concerned. It is likewise one in which every alert pharmacognosy teacher, prospective teacher and every student contemplating a career in pharmacognosy should be interested.

The value of adequate instruction in pharmacognosy in the undergraduate curriculum, methods of presenting that subject and the contents of courses given in it by some of the colleges have been topics of papers and discussions in previous Teacher's Conferences.

It should be apparent from a study of these and related courses in the average pharmaceutical curriculum that unless the undergraduate student be given an opportunity to elect more advanced courses in pharmacognosy in addition to such basic courses as botany, zoology, introductory pharmacognosy, pharmacology and chemistry of the average pharmaceutical curriculum, his opportunities for earning a living in some specialized field of pharmacognosy are exceedingly limited.

The preparation received in the undergraduate course leading to the B.Sc. in Pharmacy has no doubt acquainted him with the nature of many drugs and their constituents and prepared him to cope with practical problems dealing with the identity, purity, quality and preservation of the official drugs and a limited number of unofficial ones, to read the lit-

*Read before the Conference of Teachers of Pharmacognosy and Pharmacology, at the 1943, Columbus meeting.

erature pertaining to the subject with some understanding, and to know where to go for references. He should from his knowledge of the constituents of vegetable and animal drugs be able to comprehend incompatibilities in mixtures containing them. He has learned enough of the subject of pharmacognosy in the undergraduate years to appreciate the necessity of obtaining graduate training in plant chemistry, plant morphology, physiology and genetics, chemical microscopy, histological technique, technical microscopy and drug plant breeding in order to broaden his horizon of opportunity, if he intends to make pharmacognosy his life work.

He needs the training he has received as an undergraduate to intelligently meet the problems of a pharmacist arising in the handling, purchase and dispensing of vegetable and animal drugs and derived products. Apart from retail, wholesale and hospital pharmacy and the way open for him to advance himself in the science through graduate study, the chief positions open for him are as a Federal or State Drug Inspector and salesman for a crude drug or pharmaceutical manufacturing house.

Every retail and hospital pharmacist should be a practical pharmacognosist. To safeguard the public health he should be able to ascertain, when necessary, the identity, purity and quality of the whole and powdered drugs he sells, whether these are prescribed by physicians, veterinarians or dentists, used for pharmaceutical necessity, or called for over the counter. He should also be able to answer questions concerning their origin, active constituents and uses when interrogated by physicians and others.

Pharmacognosy is an applied science into the pursuit of which a number of scientific disciplines enter. Its scope and problems extend beyond the medicinal plants and the vegetable and animal drugs of the pharmacopœias and formularies. Many other materials of plant and animal origin such as commercial gums, resins, starches, waxes, oils, rubber and other latexes, vegetable dyes, spices, aromatic herbs and nonmedicinal condiments, plant insecticides, rodenticides, plant and animal fibers used in the paper, textile and other industries, cereals, coffee, tea, cocoa and other beverage foods have long been submitted to pharmacognosists for determination and evaluation.

In pharmacognosy of the present day chemical as well as physical, biological and microscopic methods are employed in the solution of its problems. The constituents of plant and animal substances and factors responsible for their production and variation in the living organism have become no less important than the identity of the drug or other economic product of biological origin. This has obviously increased the opportunities open to properly trained persons.

The old, narrow concept of pharmacognosy, conceived by American authors during the early history of that science in this country, as "the science of crude drugs" never adequately covered its scope. For many years this concept was followed as a matter of convenience by a number of our pharmaceutical colleges because of the *division of labor* in their curricula. It is indeed, unfortunate, that some pharmacognosy teachers have arbitrarily limited the definition of pharmacognosy to fit into the narrow scope of their courses and the facilities they have available for presenting them.

Let us turn, now, to the needs and opportunities of the expertly trained pharmacognosists. It is obvious that the needs of these will vary somewhat depending upon the field or fields of pharmacognosy they wish to enter. For example, the expert in the breeding of medicinal plants would require in his training more emphasis on the subjects of cytology, genetics, plant physiology and the chemistry of soils and less emphasis on the subjects of advanced plant morphology and chemical microscopy than the pharmacognosist in the service of a crude drug house or an appraiser's store of the United States government.

I would suggest to the graduate student contemplating a professional career in pharmacognosy that in addition to his basic undergraduate training in general and pharmaceutical botany, zoology, physiology, college English, mathematics, physics, chemistry and pharmacy, that he elect courses in the comparative morphology and taxonomy of seed plants, histological technique, animal histology, plant chemistry, technical microscopy, plant physiology, plant cytology and genetics, drug plant cultivation and advanced pharmacognosy. The advanced pharmacognosy course should include a series of practical problems in different phases of pharmacognosy.

Owing to the breadth of training in diversified fields of pure and applied natural sciences, it is possible to acquire by the ambitious student aspiring for a career in pharmacognosy by the time he has received his Doctor of Philosophy degree, his opportunities for filling positions of responsibility and honor are far greater than those of one whose training in college has not gone beyond the bachelor's course.

Among the positions for which pharmacognosists of this class are eligible are those of pharmacognosist, assistant and junior pharmacognosist, plant histologist, plant physiologist and microanalyst in the U. S. Department of Agriculture, including positions in Agricultural Experiment Stations scattered throughout the country and in the U. S. Appraisers Stores. Other positions for which they are eligible include those of pharmacognosist in crude drug and importing houses, control workers in many pharmaceutical manufacturing houses and textile plants, teaching positions in pharmaceutical colleges and universities, laboratory technicians in various professional and industrial institutions, etc.

During the present war, our government has experienced difficulty in obtaining a sufficient number of pharmacognosists properly qualified to man the production of Cinchona, rubber, and many oil-plant projects in Central and South America. It has had to go to academic institutions for most of the personnel having the training required for the work.

There are many past instances of where the United States Department of Agriculture and some of our pharmaceutical manufacturing and crude drug houses have been obliged to employ chemists, agronomists, horticulturists and botanists trained in non-pharmaceutical institutions for carrying on kinds of duties the pharmacognosist is trained to perform.

The alertness of the Food and Drug Administration in running down lots of adulterated drugs passing through interstate commerce and its insistence that drugs and spices are to be free from filth has led many drug firms to better protect themselves by taking on pharmacognosists. Some of these had formerly relied entirely upon chemists in carrying out control work on crude drugs.

Too much is being taken for granted by some investigators in pharmacology and chemistry in respect to the botani-

cal source of the drug or plant materials which they use in their investigations. It is obvious that the results of such researches are worthless and are apt to mislead clinicians. The pharmacognosist with training in comparative morphology and taxonomy of plants has an opportunity to be of service in authenticating these materials before the pharmacological and chemical researches are attempted.

Opportunities continually occur in the teaching of pharmacognosy and related subjects in colleges of pharmacy. Most of the openings within recent years require the teacher to have a Ph.D. degree. I believe that Deans will confirm the observation that the supply of pharmacognosists with that degree is far too short. Here is a real opportunity for more colleges of pharmacy to encourage and develop good teachers in this science.

Opportunities for research in little explored fields of pharmacognosy offer many attractive problems. Some of them present a real challenge to the skill and ingenuity of American pharmacognosists.

For instance, we know very little regarding the possibilities to be achieved in feeding certain medicinal plants with chemicals so as to increase their desirable active principle content. Some suggestions in this direction may be obtained by reading the published investigations of Dr. William Crocker and his associates of the Boyce-Thompson Research Foundation of Yonkers, N. Y. In this type of investigation the problems to be solved require a combination of knowledge of pharmacognosy, plant chemistry and plant physiology.

Chemists and pharmacologists are experiencing difficulties in formulating reliable assays for such drugs as Digitalis, Aconite, and Rhubarb. It seems probable that the root of these difficulties with Digitalis and Aconite lies in the possibility that each of these drugs is yielded by different chemical entities within the species, that not all *Digitalis purpurea* plants are chemically alike. The answer to that hypothesis can only be solved through the application of genetics, through the breeding of pure strains of chemically identical individuals and the perpetuation of the most desirable of these as sources of future drug.

Moreover, the surface of quantitative microscopical analysis has hardly been scratched. A number of methods have been published but we have only two methods in this field which can be relied upon to give results within the range of a fraction of one per cent of error and, as far as is known, these can only be depended upon for a very few problems. Research in this very little explored field of pharmacognosy has pitifully lagged, evidently owing to its time consuming character and the less spectacular appeal it is believed to make. Nevertheless, the need for further investigation in this field is very urgent, right now, especially in connection with the determination of the percentage of insect remains, rodent hairs and other contaminants and adulterants of drugs, spices and foods.

The opportunities for well trained pharmacognosists are greater now than they have ever been in the history of this country, but, unfortunately, the supply from our pharmaceutical institutions has been too small to meet the demand. This has been owing to the inadequacy of the courses offered by most of the colleges of pharmacy to meet the needs of the government and industry in specialized fields of pharmacognosy.

Conversing with scores of young pharmacists who are now in the service I am impressed by their desire to get current reading material pertaining to pharmacy.

This eagerness on their part is a most hopeful sign and augurs well for the future because he who reads will always be informed, interested and up-to-date, all of which will favorably reflect on our profession.

Questioning many of these young men about trade journals they should have access to, I find that the store owners where they had been employed have been lax in forwarding to their former employees such publications. Likewise I have learned that many publishers send copies of this Journal to the PX (Post Exchange) or to the General Hospital Libraries. In the first case the publication never gets to the Hospital Library.

The unanimous opinion of those spoken to was that the best way to centralize the publications is to address them to Pharmacist—Station Hospital Library.—John F. McCloskey.

The American Institute of the History of Pharmacy through its director, Dr. George Urdang, has presented the membership with an elegant photographic reproduction of the Sixteenth Century painting by an anonymous artist of Cosmas and Damian, the Patron Saints of Pharmacy and Medicine. This is a real contribution to the enrichment of visual education in the field of historical pharmacy that the Institute is constantly carrying on.

Editorials

The Myth of Pharmacy

Pharmacy is not a myth to those of us who teach it, but I am beginning to think it is in the minds of most people including laymen and "'drugstore" operators.

We have heard much in recent years about the rejuvenescence of the professional attitude within the pharmacy group; and the division of present day pharmacy into two groups, one professional, the other, merchandising. We have written papers and articles totaling hundreds of pages describing the labor of this professional rebirth but has the delivery been accomplished or will it be? To the idealistic teacher, progress is being made. The public and the "drugstore" owners are still skeptical. To the teacher, pharmacy is a living thing that grows and responds to research, planning, and direction. We picture pharmacy as a very substantial profession based upon a *scientific foundation* and necessary in a *highly-skilled technical* way to the health of the people. We write books about the scientific services performed by the pharmacist for the public welfare, lecture on these subjects for an academic year and never repeat ourselves. We built a four year college curriculum around the techniques and processes that are pharmacy.

We feel pharmacy, see it, love it. We give it our lives and share with it our professional hopes, aspirations, and ideals. We work for it, cultivate it, nurse it and even fight for it in the halls of Congress. Pharmacy to us is a profession and we try to cultivate the same viewpoint within our students.

They aspire to carry that idealism into actual practice. In general, their enthusiasm is forcibly turned into frustration when after graduation they are employed. If pharmacy is not a myth surely the futility and frustration in attempting to live the picture would not exist.

The evidence that indicates pharmacy is a myth is certainly piling up. For example, we teach our students that they are to become registered under the law as licensed practitioners of an important phase of public health work. They are actually given state examinations of college grade in the

basic sciences and, if successful, they do become registered with official gold seal certificates in recognition of it.

They then seek employment and what are they called by their employers—*clerks*. You probably snort with disbelief. One would scarcely think that an employer who pays for the dignity of a professional title would deliberately belittle it. Yet careful check will reveal that over 90 per cent of the employers refer to their registered help as *clerks*. Perhaps pharmacy as we see it is a myth after all. Only clerks are real.

The data that pharmacy as we conceive it is mythical, continues. When my practical friends of the "drugstore" see me the greeting so often is, "When are you going to start teaching the real needs to your students? Every time I hire one of your graduates, he is disappointing. He has the idea that all he wants is to work in a prescription store. He does not know or care anything about selling." My reply that college is the place to learn the scientifical fundamentals of a professional background and that the cup of his commercial education can best be filled in the "drugstore" is never satisfactory. What I should do is see that the student knows such things as when to moisten the sponge in the humidor. After all cigars are sold every day, but how often do you fill an ophthalmologic prescription containing sodium sulfathiazole and a surface active agent which will improve corneal penetration. Pharmacy must be a myth or the latter knowledge would be at least as important as the former.

I have contended for years that every registered pharmacist would prefer to be professional but seeing so little *real* effort being made to that end, I am almost forced to conclude that it is only the few and the younger new comers who care to pay more than lip service to their calling.

Who is at fault? Is pharmacy as we teachers see it a myth —something impossible in real life? Had we better wake from our dream and become *practical* or shall we stick to our guns and save the "sinners" where we can? If we make the latter choice we better get heavier ammunition to justify our course. Despite our optimistic speeches and writings, the going is getting tougher day by day.

L. Wait Rising,
University of Washington.

Latin as a Separate Course

Occasionally one hears or reads that So-and-So objects to Latin being taught as a separate course in the pharmaceutical curriculum. Seemingly these objectors are those who do not handle the subject in any way themselves. From their tones one gathers that they would refuse to consider it among their own offerings if the opportunity were afforded. For many years I have listened to these outpourings with an unprejudiced mind in a sincere effort to find real substance for such views and not once before have I voiced my own belief in the argument. I will do so now because I have been teaching Latin to students of pharmacy for thirty odd years both in combination with other subjects and as a separate course. This experience may give my views some value.

Latin, of course, is one of the principal languages of science. Medicine, pharmacy, botany and the other sciences have used it freely for generations and their modern nomenclatures show no tendency to depart from it as a source of word supply. There can be no solid argument against the teaching of Latin to students of pharmacy. The only sane debate must center in the *way* it is taught.

One reason assigned against its treatment as a separate subject is the time element. Approximately 36 hours are considered adequate for presenting the subject. This means three didactic hours a week for a quarter or two hours for a semester. This limited time seems to be the main if not the only reason why some people object to Latin as a course in itself. Such reasoning seems utterly specious to me for it disregards the primary question of how it can best be taught. Mechanical considerations must, of course, enter into the formation of a curriculum since there should be a reasonable balance from term to term, but mechanics should never take precedence over sound pedagogy. If students can master the essentials of Latin better when it is given as a separate course, then we teachers owe it to them to find a way to do this since after all they are our only excuse for being teachers.

One major weakness to be noticed when Latin is combined with another course is that the instructor finds it difficult to weave the language material into the course without sacrific-

ing one or the other of the two subjects under consideration. This fact is better understood by those who have tried to do justice to such a combination than by theorists who do their quarterbacking from the side lines. The presentation of Latin requires a different sort of treatment than that necessary for any of the basic or applied subjects in our curriculum. Just how and where, for example, can one combine Latin properly with a course in pharmacy, or pharmacology, or pharmacognosy? Yet it is in these fields that Latin as a combination course is usually found. The subject matter is utterly dissimilar. (If the goal is simply to have the student memorize like a parrot the latinized names of drugs, then, of course, the job can be done, but it would be sinful to pretend that Latin is being taught.) What happens in such a combined course is that a mere fraction of the class period is taken up with Latin while the major portion of the hour is devoted to whatever else is being taught. Oftentimes several class periods pass with the instructor, centering his interest and attention in his "major," forgets, all about the Latin he is supposed to teach. If, however, this same instructor is required to handle Latin as a separate subject, he or she confines the period to Latin. Both teacher and student understand what is expected and are judged according to what is given and what is gained. Latin should either be offered as a separate course or else the catalogue should omit mentioning it.

I have made the statements just given from personal experience and from reasonably intelligent observation of what others like me have done or are trying to do. Nothing said is intended to mean that the presentation of Latin *terminology* should be confined to a single course for it is desirable to deal with nomenclature whenever the opportunity is afforded. I simply maintain that the essentials of Latin merit a separate place in the curriculum and that to attempt to combine them with some other course results usually in a scrambled mixture that is not good teaching.

J. Grover Beard,
University of North Carolina.

The Place of Pharmacy in a New World Order

In times when uncertainties and anxieties are ever present, when chaos (whether organized or regimented) grips minds and hearts, it is well to review the past and evaluate the present in the hope that the facts thus revealed may give some intimation of what is to come or what should come.

Pharmaceutical education has unquestionably made some progress. In the light of conditions which have been revealed as a result of the failure of governmental institutions to recognize and utilize our professionally trained men and women in the war effort, our failure has been to convince them that the professional training of our graduates is of such a character that there is a place for their professional services. I do not think that the governmental or other professional agencies have adopted this viewpoint arbitrarily, but their conclusions have been arrived at because of our failure somewhere along the line to clearly outline the aims of pharmaceutical education and practice. These agencies have been influenced by what they see in pharmaceutical practice.

Instead of being depressed or discouraged, we should be stimulated and encouraged to turn on the X-ray and really evaluate and diagnose our troubles. This is an instance, it seems to me, when the practice of self diagnosis and self treatment is not only justified but demanded. The time, therefore, seems to be upon us when our decisions will govern the place of pharmacy in the future world.

Turning a critical eye on existing conditions, it is revealed that there is no integration of the curricula in medical and pharmaceutical education programs, and since this is a fact, our graduates of pharmacy schools are not competent to give to the medical practitioner the information he needs in regard to the medicinal agents on which he depends for the diagnosis and treatment of disease. The medical schools, not recognizing that a properly coordinated pharmaceutical educational program might have much to offer, fail to give their students instruction and advice in the matter of technical knowledge the pharmacist is, or should be, able to give him in the choice of medicinal agents or the combinations in which they should be associated.

Is it not well, therefore, for the American Association of Colleges of Pharmacy in cooperation with the American Association of Colleges of Medicine to consider ways and means by which the two curricula may be integrated to the end that medicine, through the intelligent cooperation of pharmacy, may render a more definite service to the public we both serve?

What has been said in the matter of a proper integration of medical and pharmaceutical curricula applies with just as much force in the field of public health. That tremendous progress has been made in the control of contagious and infectious diseases cannot be denied, but these achievements could have been multiplied many times over had pharmacy been made a definite part of the public health program. Pharmacy is on the frontier in health matters and, through the drug stores of America, the pharmacist is usually the first person in the community to recognize a health menace, for all of the people of America filter through the drug stores of America, and, therefore, health menaces are thus revealed in their incipiency. What a transformation in health education and practice might be achieved in America should organized pharmacy be made a definite and integral part of the health program of the future based on the assumption, of course, that our pharmaceutical curriculum will be so modified that our graduates may be qualified to serve in this capacity!

Regimented medical practice, pharmaceutical practice, and public health practice would indeed become unnecessary and undesirable from governmental and public viewpoints if all of the agencies training young men and women to serve in the public health fields could sit down together and not only integrate their programs of instruction but, as well, integrate their ideals of service!

Robert C. Wilson

Some Further Thoughts on the Twenty-four Month Four-Term Program

I have just finished reading Editor Lyman's editorials in the October number of the American Journal for Pharmaceutical Education and am most favorably impressed by what he has said. Especially do I appreciate the spirit which he has shown—the desire not only to state his own convictions as clearly as possible, but to understand and appreciate the other fellow's opinion, as well. That is the the attitude and spirit which will make for unity and progress in our profession.

At another place in this same number of our Journal, where the four-term program for colleges of pharmacy is being discussed, I read, under the title of, "Let's Not Turn Back the Hands of the Clock," the following comment: " 'What the motives are for a backward step of this type is anybody's guess. . . . Somewhere in the background it may be safely assumed that somebody can see his way clear to save money or make money, if he can be successful in imposing his degradation on pharmaceutical education."

You notice the use of the two words "guess" and "assumed" in this statement. I do not feel that we should guess at the other fellow's motives, nor should we assume them to be sinister when, as a matter of fact, they are probably fully as sincere and accurate and proper as are our own.

I do not wish to be ungenerous to the author of that statement, but I do not feel that it is of a constructive nature and I do not believe that we should indulge in assumptions of that sort. They merely cause misunderstandings and hard feelings and make no positive contribution to the question under discussion.

Without in any way being argumentative, I would like to call attention to a few pertinent facts concerning the four-term, twenty-four month program which are not always kept before us.

In the first place, let us get an accurate over-all view of what this "terrible" program, which was proposed as a *wartime* measure, really is. Possibly it might prove helpful to state it as follows: If a student is in college from 9 o'clock

until 12 o'clock and from 1 o'clock until 4 o'clock five days a week, and from 8 o'clock until noon on Saturday, he will, in a period of eight twelve-week terms covering a period of 24 months, have completed 3264 hours, which is in excess of the number of hours required for the Bachelor of Science in Pharmacy degree by either the A. A. C. P. or the A. C. P. E.

Under this program, the student would have a schedule of 34 hours a week. He would have time for study late afternoons and evenings, five days a week. He would have Saturday afternoon and evening and all day Sunday available for study and recreation and would also have a full month of vacations during every calendar year.

Is that too heavy a *war-time* program? Can our pharmacy students not stand up under a program of thirty-four hours a week, most of which is laboratory work, when medical students are assigned in excess of forty hours a week of an equally difficult curriculum? Let us give this question careful thought before answering in the negative and let us be careful that our answer is fair to our pharmacy students and to the admission officers of our various colleges of pharmacy.

Another point which we should keep in mind is that the four-term, twenty-four-month program was not a creation of the A. C. P. E. It was favorably recommended to the War Manpower Commission by a national committee in Washington, D. C., known as the Essential Activities Committee. The War Manpower Commission then recommended the deferment of pharmacy students under certain conditions which were set forth in an amendment of Activity and Occupation Bulletin #33-6, which was released to draft boards on July 1, 1943.

About the time this bulletin was released, its conditions were reviewed in Washington by President Newton, Dean Rogers, Chairman of the Executive Committee, Dean Muldoon, and Dean DuMez, as A. A. C. P. members of pharmacy's War Emergency Committee, and by Dr. Kelly, Dr. Fischelis, and Mr. Bohrer, as A. Ph. A. representatives. All phases and implications of the program were discussed at that time, and the opinions expressed at this meeting by these highly respected representatives of the profession of pharmacy were very helpful in enabling the A. C. P. E. to arrive at the decision which it made on July 25, 1943. The Council had been unfavorably

criticized for not taking earlier action. It delayed because it wished to be cautious and conservative and to have before it as many vital facts and opinions as possible when its decision was made. The A. C. P. E. merely gave accredited colleges permission to use this program if they cared to do so, *solely* as a *war measure.*

The A. C. P. E. approved of the twenty-four-month program, insofar as it seemed necessary to do so, in a very cautious and guarded manner. The Council purposely did not say that the Bachelor of Science in Pharmacy curriculum could or could not be satisfactorily presented in twenty-four months; neither did it make any such comment relative to the thirty-two month program, the operation of which it had earlier made possible. It refrained from doing so because it felt there might be an element of danger involved in such a statement and it wished to take the most cautious action possible. The A. A. C. P. took bolder action in its evaluation of a thirty-two month program.

The Council took the action which it did because it was of the conviction that pharmaceutical education should, if possible, be maintained throughout the war period and it was assured that the twenty-four month program contained the best terms obtainable from the authorities in Washington, D. C.

It should be pointed out, in passing, that the thirty-two month program is not, strictly speaking, an accelerated program. It contains the same number of class and laboratory hours per week as did the four-year program. It merely involves the giving up of much of the vacation periods which were available under the four-year program. It involves rather the minimum amount of change which might very properly be expected of loyal American citizens. Many people feel that at least a minimum amount of acceleration would provide a good "plus" element for a really virile war program.

The Council also had the advice of the secretary of the N. A. B. P. at the time its action on the four-term program was taken. The Council's action was unanimous, and its members still feel that they acted wisely and in the best interests of the profession of pharmacy.

The members of the Council were aware of the fact that the Council was being attacked and unfairly criticized at the

Columbus meeting. The question, "Do you realize that the Council has dealt pharmacy a mortal blow?," finally resounded from one end of the hotel to the other. We regretted the situation and asked the Executive Committee of the A. A. C. P. to meet with us in order that we might make our position clear. They did not take the initiative in arranging such a meeting. We invited them to meet with us and we feel that much was gained from the meeting which followed.

I sincerely hope that this letter has not sounded argumentative or resentful. I have merely tried to make clear that no Council member wishes "to turn back the hands of the clock." The Council's decisions have had no such influence, but very definitely a contrary one.

In conclusion, may I express the hope that we abstain from guesses and assumptions in regard to the other fellow's decisions and conduct and that we become increasingly critical of our own. Such an attitude will make for solidarity in our ranks and enable us collectivey to make of pharmacy an ever more useful and highly respected profession. It will also help to keep the hands of the clock turning in a clockwise direction. Who is there among us who would have it otherwise?

Ernest Little

Who Will Teach Them?

At Columbus, the colleges decided rightly and unanimously against any further acceleration of the course in pharmacy. They realized very well that student losses would continue, and probably increase, as a result of their action. But they voted courageously, and went home to take whatever measures they could to cope with the problem. Since then student losses have mounted. In general, the current situation is discouraging, but the colleges will continue to operate as best they can until the war ends, or until relief comes from some other source. After victory, enrollments should climb rapidly to normal, or above. The financial strain will be eased. Probably the colleges will then have all the students they care to accept. BUT WHO WILL TEACH THEM?

The question is a serious one. We must be as alert to maintain the quality of our instruction as we are to guard its

extent. We must have a sufficient number of teachers. They must be well trained. They must be good teachers.

The war has skeletonized teaching staffs everywhere. Some schools have released teachers because there was no work for them to do. Others have postponed the filling of vacancies caused by retirements and voluntary withdrawals. Teachers have been lost by enlistment and draft, and through the calls of industry, research, and governmental agencies.

When, eventually, student enrollments increase again, faculties must be enlarged. All the former teachers, and more, will be needed. But many of them will not be available. Qualified replacements for them will not be easy to find. When peace comes, some of our teachers will have made the supreme sacrifice. We pray that their number may be small. Some, having found it to their liking, will remain in military life. Others will develop strong interests and find attractive opportunities in the fields other than education in which they are now working. We shall find that a considerable number of them will be reluctant to exchange the higher salaries of industry for the smaller salaries and the lesser economic security of teaching.

The teachers who will thus be lost to pharmaceutical education are mostly young men. They are among the most highly educated workers in pharmacy. (That is precisely why they are able to find so many opportunities in so many fields.) They are the very ones who should, for the good of the profession, be teaching the new recruits to pharmacy. We need them all the more because there are so few of them. Our faculties benefit from the infusion of new blood. We need these young teachers for their freshness of viewpoint, for the recency of their information and experiences, for their energy and enthusiasm, for their ability in research as well as in teaching, for their interest in association work, and for the assistance which they are so glad to give in conducting refresher courses, pharmaceutical clinics, and other extracurricular activities.

Today, our best teachers are trained in our own graduate schools. Graduate enrollments in pharmacy have always been small—too small—although in the years immediately preceding the war they tended to increase. At the present time, only one hundred persons are registered for advanced training

in all our graduate schools, and some of these study only part-time. Not all of the hundred plan to become teachers. Regardless of the fact that enrollments are already pitifully small, local draft boards have not found it desirable in a number of cases to postpone the induction of graduate students, even those well along toward their degrees, until their courses had been completed. Pharmaceutical education must inevitably suffer greatly unless something is done soon to encourage a greater number of students to undertake graduate work and, more pressing at the moment, to arrange to keep in our graduate schools those who are already there. This is an immediate problem. A related long-range problem needs study and action, too. We must find a way to provide not only more, but better, teachers for our colleges.

Everyone who tries to teach is not a successful teacher, even though he may be conscientious and willing. He may not know *how* to teach. The more highly trained a man is in his field, the better teacher he is likely to be. It is easier to take a cupful of water from a jar that is well filled than it is from one that has only a cupful in it. That our Association recognizes this fact is apparent from the qualifications listed for faculty members in our By-laws. The day is gone forever when instructors of inferior ability and training can be permitted to teach in our schools. We have learned through sad experience that such men are inept, uninspiring and ineffective teachers. On the other hand, so are some of our most brilliant and highly trained researchers. Such men may not know how to teach either.

Every dean worth his salt strives continually to make good teachers of the young faculty men who come under his direction. If the dean doubts his ability to guide them, he can obtain assistance from his school of education. We are not impressed by some of the work published by professional schools of education, but we feel that the results of a comparative survey of the teaching methods now in use in schools of pharmacy, conducted by competent workers and directed by a responsible school of education, would give pharmaceutical educators plenty of food for thought. We are confident, however, that the methods we employ will be found to compare favorably with those used in medicine, dentistry, and the other health professions, even though our methods might not meet with the full approval of modern educationists. In the past,

we have given too little attention to education as such. Teachers in colleges of pharmacy should be as much at home in the field of modern education as they are in the field of modern pharmacy. How many of them are?

To round out our educational set-up, there should be offered a combined graduate curriculum in pharmacy and education, comparable, perhaps, to the pharmacy-engineering curriculum recently introduced at Purdue University. A few universities could offer such a program advantageously. The curriculum would be designed, first of all, to give an understanding of the present day problems of education. It should contain at least one down-to-earth applied course devoted to special technics and methods, including classroom and laboratory procedures; preparing the lesson; preparing the examination and (often less well done) rating it; the use of sensory aids; and other practical teaching helps. The graduate of such a course of study would face his classes with confidence for he would not only know his subject, he would know how to teach it.

Admittedly, exposing a man to such a combined course of study could not make a good teacher of a hopeless or indifferent one. But it would make a more successful and a more understanding teacher of every person who completed it conscientiously, regardless of how skillful that person may have been at the start.

The whole matter of teacher training is worthy of study by our Problem and Plans Committee, if it is not already studying it. After a preliminary study of the problem has been made, it might be worth while to draw up a suitable experimental curriculum, one that would meet with the approval of both professional educators and professional pharmacists. Later, approaches might be made to selected graduate schools for the purpose of inducing them to pioneer in this new field.

To state that to a great extent the pharmacy of the future lies in the hands of the teachers of today is to repeat a cliche. But we are sure that soon we shall need more teachers. If pharmacy is to progress, they must be well trained, competent, conscientious instructors. We have suggested one possible way of providing them.

Hugh C. Muldoon

The President's Page

The New Year brings hope to the members of the Association that our efforts may, before the year is over, be confined more largely to peace time problems rather than those of war. For more than three years young men have been called from our schools, and the profession as a whole, to serve with the Armed Forces or some place in the war program. No doubt many more will continue to be called, and high school graduates forego for the time being entering our pharmacy halls. Nevertheless, we are informed that more than half a million service men have been released or discharged. Some of our disabled students and graduates have already been returned to carry on with their studies or professional duties. Whether or not 1944 finds our enemies defeated and our boys returning to their peace time pursuits, our Association must be prepared to offer a constructive program of student training.

Committees of our Association are vigorously at work giving consideration to the major issues which will face the profession in developing and operating a post-war educational program. In collaboration with government educational committees, some of the important questions being considered are: An adequate procedure for rehabilitation and the training of returning graduates and undergraduates; type of education or "refresher" courses to be offered; facilities and teaching personnel of our schools; financial aid for the discharged soldiers and many other factors concerning the program. The solution of the post-war training and placement program will require far-sighted planning by federal, state, and educational agencies of our countries and will require team work by the members of our Association.

October 11, 1943, the chairman of the Executive Committee mailed to all member colleges a questionnaire regarding future action of the War Emergency Advisory Committee. With but one dissenting vote, the colleges favored a continuation of function of this committee with the War Activities Committee of the A. Ph. A. The co-chairmen, Dean DuMez and Dr. Kelly, are continuing to give unsparingly of their time and energy in behalf of pharmacy students. With their hands on the throttle and assistance of others of their committees, we can be sure that they will be alert to any situation affecting

the status of pharmacy students, with respect to a deferment program.

A constructive program to orientate the subject matter of the pharmacy curricula to the end that better teaching will result or can be accomplished is one of the principal objectives of the Problems and Plans Committee. The committee is giving serious consideration as to where the greatest emphasis should be placed in the training program. The chairman feels that better organization of subject material, with better teaching, will eliminate the necessity of devoting more time to professional courses and the ultimate accomplishment would be graduates with a broader scope in the basic and professional fields.

Chairman Lyman is not alone in his belief that many of the teaching methods employed and the materials offered in our curricula are obsolete or unnecessary. To require the students to make a large number of the same type of galenicals, to require them to memorize a long list of doses or natural orders, is depriving them of the fundamental education which brings them to our schools. The achievements of the committee can be more nearly reached if our training program furnishes the students with a progressive education designed to give them the basic principles and truths, and in so doing delete any unnecessary factual material.

Forest J. Goodrich

The Index to Volume VII which is being sent out with this number, like those of all the other volumes, is the work of Prof. Zada M. Cooper. Prof. Cooper's interest in the work of the Association has never lessened and for that interest and for her service we are most grateful.

The first prize in the 1943 National Pharmacy Week display contest went to the Southern College of Pharmacy. The display told of the part pharmacists are playing both on the home front and in the armed forces. The reference books and other display materials emphasized the knowledge and professional integrity which safeguard the public health wherever American professional pharmacy is practiced. First honorable mention went to Temple University and the second, to Massachusetts College of Pharmacy.

The Editor's Page

"I would like to call your attention to something that you perhaps already know and to which you may wish to give some space in the January issue. It appears that Robert P. Fischelis has said some very sensible things on the occasion of the Remington Medal Presentation Dinner."

When Dean R. A. Kuever of Iowa wrote the above lines the Remington Medal Address had already been set in type for printing in this number. In the address, with characteristic boldness and clarity, Dr. Fischelis has outlined the program the health professions must follow if the public is to attain its vision of universal medical care and which seemingly it is going to demand. He calls attention to the fact that medicine has made progress and owes its enviable position to the fact that great care has been taken in the selection of its man power. Pharmacy has lagged behind medicine in the estimation of the public and in reality since we have not made an effort comparable to medicine in selecting better qualified students. He believes this is the time to look to the improvement of the personnel of the pharmaceutical profession and states that the first step in the technic is to stress pre-pharmacy training.

Again I quote Dean Kuever who also thinks clearly and speaks courageously, always maintaining a high level in idealism and at the same time keeping his feet on the ground:

"At this time I am somewhat at a loss to know what to think about the pre-pharmacy year. I am still not entirely convinced that three years of pre-medical and two years of pre-dental education has given those professions what they hoped for. Moreover, medicine and dentistry in the future may have difficulty in proving that it is necessary or worth while for a young person to devote from six to ten years in preparation. In connection with the pre-pharmaceutical year, one should also consider those forces which are opposed even to the present four-year course. These forces would, if they could, go back to the old two or three-year course of instruction. Unfortunately, these forces are sufficiently powerful that they cannot be dismissed with a wave of the hand. It must be obvious to everyone who is in pharmaceutical education that major changes in our course of study and in our methods of teaching cannot be suggested or recommended at this time. There isn't anything of a major character wrong with our course of study and with our methods of teaching, if these are administered conscientiously. We have developed our course of study and our methods of teaching over a long period of time and while minor improvements may be desirable from time to time, the important thing in pharmaceutical education today is to administer our course of study and our methods of teaching thoroughly and conscientiously."

Dean Kuever's thoughtful words deserve serious and respectful consideration.

In my own thinking I cannot separate the present situation from the experiences of the first World War. At that time the Student Army Training Corps was created in order to keep students in training for essential fields. A question was raised as to whether a pharmacy unit should be included in the Corps. If the war was to be of short duration one would not be needed. If a long one, it would. The War Department finally decided it should play safe and a pharmacy unit became a reality.

Colonel Arnold of the Surgeon General's office, whose task was to organize the various units in the Student Army Training Corps, declared that the weakness of the pharmacy position was due to our inadequate educational program,—the minimum being, at that time, two years of high school for entrance and two years of college training. He also said that when we placed our educational program on a basis comparable to that of the other professions pharmacy would come into its own. This statement was made to a group of pharmaceutical educators in the Congress hotel in Chicago in August, 1918. A few weeks later a number of college representatives were called to Washington to formulate a training program for the pharmacy unit. It was then that Dr. McLaurin, the chairman of the Committee on Special Training of the War Department announced that pharmacy units would be established only at those institutions where a four year college course was given. That was the handwriting on the wall and the most powerful factor which was responsible for the progress made in pharmaceutical education in the twenties.

The pharmaceutical educational picture in 1943, however, was not so very different from that of 1918. Dr. Fischelis has pointed out that if our pharmaceutical curriculum had kept pace with the medical, we might have been better treated by the War Manpower Commission in the deferment of pharmacy students. The difference, of course, between the two curricula lies mainly in the stress placed upon the background, the basic science training. To accomplish that objective, whether we like it or not, means pre-pharmacy training.

Whether this is the time to introduce pre-pharmacy training is a question upon which strong men differ. Dr. Fischelis

has made a good case for the period when the men come back from the wars, at least for those who had not begun their training in the pre-war period.

For some time I have felt that while the failure to obtain unlimited deferment for pharmacy students created a temporary hardship it would in the end work to the advantage of pharmaceutical practice. Already the compensation for professional service has increased to a point commensurate with the service. This higher level of compensation for professional services will be much easier to maintain after the war if there has not been an over-production of pharmacists during the war period. We have avoided in the case of pharmacy, exactly what happened in the case of the over-supply of chemists in the last war. The better economic status of the pharmacist will give pharmacy a greater appeal among students seeking a vocation.

There is another potent influence not yet mentioned that is driving us toward a program of pre-pharmacy training. That influence is a growing group of thoughtful, capable young men well trained in the basic and technical sciences who are insisting that the present system of teaching pharmacy before the student is grounded in the basic sciences be abandoned. These men are the future writers of our pharmaceutical literature, our textbooks and our curricula. And all teaching tools and teaching plans must be constructed to make the proper approach to pharmacy through the basic physical, chemical and biological sciences. These changes are evolutionary, not revolutionary. They are taking place because they are right. Right in the end will prevail whether we like it or not. We should face the facts and make adjustments accordingly. Pre-pharmacy training is in the offing.

I can agree most heartily with Dean Kuever when he says that the important thing in pharmaceutical education is to administer our course of study and our methods of teaching thoroughly and conscientiously. But the fact is that it is the very thing we do not do. This failing is not peculiar to pharmacy. It is found in every field of education. In my own university approximately 2000 young people enter yearly. English classifying tests place 25 per cent of them in a sub-standard course where they are taught the principles of English.

The examiners say 40 per cent should be placed in such a course. There is no way to justify teaching in the secondary schools that makes such a situation possible. What is needed to correct this condition is not more and longer courses in English in the University but better basic teaching in the secondary schools. It is a crime to waste the time of children with poor teaching.

And that brings us to the problems of the pharmaceutical curriculum. If better basic teaching was done in arithmetic and Latin we would not have the sorry spectacle of trying to elevate eighth grade subjects to the college level by giving them high sounding names and placing them in the pharmaceutical curriculum. Such a procedure does not dignify the pharmaceutical curriculum in the minds of the staffs of liberal arts colleges or other professional schools.

At a meeting of the Syllabus Committee at Toronto in 1932, Dr. R. L. Swain made an appeal for the allotment of more time to compounding and dispensing. He called attention to the fact that in this particular field where the graduate in pharmacy should be most skilled, he was notoriously weak. The truth of the statement was universally recognized and the amount of time allocated to the subject was doubled. I believe experience has shown that the increase in time has not produced a commensurate increase in efficiency, in compounding, and dispensing. As a result, I am told that some members of the Syllabus Committee that have this field in hand are seeking to increase the time allotment still further, —perhaps to doubling it again. In this connection, it might be well, to remember that the four years allotted to the study of laboratory and basic clinical medicine has not been increased for forty and more years. It is true that a year of hospital internship has been added. The increase in time in the medical program has been in the pre-medical years and in the stressing of the basic sciences. If the results adopted by medical educators mean anything it would seem to me that in pharmacy we have been and are working at the wrong end of the curriculum and to produce better compounders we need to do more and better basic science teaching.

"One thing which has concerned me quite a little about pharmaceutical education is that by the time we take into consideration all the requirements of the pharmaceutical Syllabus, our own state board of phar-

macy, the A. A. C. P., the N. A. B. P., the A. C. P. E., our local state department of education, our local university regulation, and probably other restrictions which I don't think of at the moment, we are left almost no opportunity for experimentation This, I think, is essential if we are to look to the future for the sort of wholesome growth which is essential in every field."

When Ernest Little wrote these lines, he enunciated a truth which is the foundation-stone of progress in pharmaceutical education. The scientific method consists of these steps: experiment, observation, and conclusion. This method applies to education as well as to science.

In order to make experimentation possible, many have insisted that there must be a limit to the regimentation of the curriculum. Always the curriculum must allow sufficient flexibility for experimentation. Of course there are certain basic requirements that must be met but enough freedom should be allowed to permit a school to specialize in some phase of work for which it is especially equipped or the location demands. The American Council of Pharmaceutical Education has from the beginning urged experimentation with the curriculum and no group of men has been more sympathetic with the colleges in their experimental work or more aggressive in their own field by experimenting in order to find better ways of conducting examinations than the National Association of Boards of Pharmacy.

Dr. Swain writes that he does not know what disposition will be made of the Bemarys's Survey but he feels that because of the strong reactions it has aroused, that certain positive benefits will result which will justify the survey having been made. I think Dr. Swain is right in his conclusion. It is well to have us see ourselves as others see us and have it repeated time and again. I am of the opinion, however, from my experiences of a lifetime that the public has a higher regard for the pharmacist than the Bemarys's report indicates and frequently the layman has a higher regard for the pharmacist than the pharmacist does himself. I have been amazed in my own state in going from town to town and discovering how highly regarded these pharmacists are both as pharmacists and as assets to community life. These things you do not find out by sending out questionnaires or by standing on street corners asking people or by taking polls. You find them out by living with people.

With the death of Dr. H. V. Army, there passed one of the most colorful personalities in American pharmacy in my day. He leaves behind him a long record of accomplishments as a teacher, author, and administrator. The story of his accomplishments I shall leave to others to tell. To me his friendliness, his enthusiasm, his clear eye, his ringing voice, and above all his willingness to overlook my short-comings and cheer me even when we were on opposite sides of the fence, are memories I long will cherish.

Rufus A. Lyman

In addition to their own library the students of the School of Pharmacy of the University of Connecticut have the use of the Yale Medical School Library which is only a few minute's walk distant. Over the fireplace in the Historical Library of the Yale Medical School is an inscription from wich Dean Henry S. Johnson draws inspiration and he sends a copy of it that we may share it with him. The lines are by George Stewart:

HERE SILENT SPEAK THE GREAT OF OTHER YEARS : THE STORY OF THEIR STEEP ASCENT FROM THE UNKNOWN TO THE KNOWN : ERRING PERCHANCE IN THEIR BEST ENDEAVOR SUCCEEDING OFTEN . WHERE TO THEIR FELLOWS THEY SEEMED MOST TO FAIL * HERE THE DISTILLED WISDOM OF THE YEARS : THE SLOW DEPOSIT OF KNOWLEDGE GAINED AND WRIT BY WEAK . YET VALOROUS MEN . WHO SHIRKED NOT THE DIFFICULT EMPRIZE * HERE IS OFFERED YOU THE RECORD OF THEIR DAYS AND DEEDS : THEIR STRUGGLE TO ATTAIN THAT LIGHT WHICH GOD SHEDS ON THE MIND OF MAN . AND WHICH WE KNOW AS TRUTH * UNSHARED MUST BE THEIR GENIUS . IT WAS THEIR OWN . BUT YOU . BE YOU BUT BRAVE AND DILIGENT MAY FREELY TAKE AND KNOW THE RICH COMPANIONSHIP OF OTHERS' ORDERED THOUGHT.

Gleanings from the Editor's Mail

We are heartily in accord with the action taken by the Colleges and the Boards at the Columbus meeting, and are happy indeed that the movement to shorten the pharmacy course to twenty-four months was stopped. There is no question that it would have been a very bad thing had that happened, but with men like yourself and others who are clear thinkers and know what is going on, I am sure that pharmacy's future will be protected.

Chicago
October 27, 1943

J. W. DARGAVEL,
Executive Secretary, N. A. R. D.

May I take this opportunity, also, to compliment you upon your recent comment on the Bernays survey. It seemed to me to be a shame to spend so much money on a project to have a lot of facts returned to us of which we were already aware.

JOHN E. KRAMER,
December 30, 1943 Philadelphia College of Pharmacy and Science

I was amused by your treatment of my DRUG TOPICS editorial dealing with the Bernays Survey. At this point let me say that the "findings" of the survey as they appeared in DRUG TOPICS, and to which you referred, were lifted verbatim from Mr. Bernays' American Pharmaceutical Association address.

Your statement that "Dr. Swain felt that he must say something nice about the survey" is a bit misleading. I was asked to serve as a member of the Steering Committee along with Dr. Kelly, Dr. Little, Dr. Newcomb, Dr. Dargavel and others representing various phases of the drug industry. However, it was not possible for me to attend the original meeting of the Steering Committee when matters of policy were decided upon.

My praise of the Bernays survey in my DRUG TOPICS article was based on my belief that it has a certain basic worth. As I understand the situation, Mr. Bernays was asked if he would direct a public relations program in behalf of pharmacy, if the necessary arrangements could be made. Before deciding his own course of action, Mr. Bernays said that he himself knew nothing of pharmacy, its organization and its problems—he would first inform himself with respect to these before giving an answer.

I share your view completely that the one determining factor in pharmacy's relations with the public is the individual pharmacist, and the character which he gives to his pharmacy. If pharmacists could be made acutely aware of this fact, it would be of incalculable value in bringing the public to a more accurate appreciation of the true significance of pharmacy to public health and community betterment.

New York
December 29, 1943

ROBERT L. SWAIN,
Drug Topics

Notes and News

Alabama Polytechnic Institute, School of Pharmacy.—Prof. George W. Hargreaves has been elected president of the local Sigma Xi club, is vice-president of the Phi Kappa Phi and teaches the men's class of the Presbyterian Church.—G. G. Smith has been elected to Phi Kappa Phi.—Prof. A. J. Michel is on leave from the department of pharmacy and is teaching navigation in the Navy Ground School training program.—Five men were graduated at Thanksgiving time. This left 21 students in school, 7 of whom are women. One of them is Mrs. Babelle Sconiers whose husband is in a German prison camp. He was a gunner on a flying fortress. —Dean Blake attended the South-Eastern Pharmaceutical Conference held at Atlanta in November.

University of Colorado, College of Pharmacy.—During the past year the college has assisted the school of nursing by giving a course in beginning pharmacy for nurses. The material given is what is usually covered under the title "Drugs and Solutions." A more advanced course covering synthetic drug products is given to graduate nurses. Dr. Sprowls is also giving the first course to a class of nurses in the Colorado General Hospital at Denver, the classes meeting once or twice a week at night. These courses have an eucational value to nurses and there is evidence that they are creating a mutual respect between the professions.

University of Connecticut, College of Pharmacy.—The first gold star placed in the service flag is for Lt. Leslie C. Blakeslee, 1942, of the Marine Corps who was killed in action somewhere in the Pacific. He enlisted in the Marines in July, 1942, trained at Paris Island and later in the officers training school at Quantico, Virginia, where he was commissioned in June, 1943.—Soloman Ballier, Jeanette Ehlert and Lola Leng have been elected to membership in the Alpha Gamma chapter of Rho Chi.—Prof. A. A. Maier and Mr. Wallace F. White spoke on medicinal remedies for use by chiropodists at the mid-winter meeting of the Connecticut podiative society in New Haven in January. They also addressed the New Haven association of retail druggists.—Mr. N. W. Fenney spoke on pharmaceutical preparations before the students of Yale University medical school in December.

Duquesne University, School of Pharmacy.—On November 1, over KDKA, Dean H. C. Muldoon gave an address, "Soldiers on the Home Front" in the interest of pharmacy week. He called attention to the importance of the pharmacist as an important factor in community health and that in recent years, the function of the pharmacist has been greatly extended and with it the need and the development of a much broader background and more extensive technical training. Especially did he stress the need of a more specialized training on the higher levels to prepare men to do creative work in the search for new drugs and substitutes for old ones in the world-wide struggle against disease.

University of Florida, School of Pharmacy.—During pharmacy week three fifteen minute radio talks were made by students and faculty members under arrangements made by Rho Chi. Several displays were also set up on the campus and in local drug stores.—A recent issue of the

Florida State Pharmaceutical Association was devoted to women pharmacists in the state. Most of the articles were written by recent graduates of the school.

Fordham University, College of Pharmacy.—Dr. L. J. Piccoli has introduced a course for seniors on contemporary applied therapeutics covering such agents as penicillin, the sulfa compounds, biologicals and endocrines. The war has placed special emphasis upon public health and pharmacists are expected to be conversant with the advances already made and the many problems which will confront us in the post-war period.—A general committee has been named to consider plans to meet the educational needs of the post-war period. Pharmacy is represented by Dean Charles J. Deane, Dr. Peter J. Conroy and Prof. Alfred J. White.—Graduation exercises were held for the senior class on December 29. Prizes for excellence in scholarship were awarded to Jasper C. Maruzzella, Robert R. Simner, Anthony P. Morabito, and Vincent D. LoGalbo.

Loyola University, College of Pharmacy.—Lloyd J. Salathe, 1934, of the Pure Food and Drug Administration recently spoke before the Chemistry Club concerning the function of the Administration.—Dean John F. McCloskey is beginning his second year of service as editor of the Louisiana Pharmacist, the official journal of the state association.—Dean McCloskey has presented the school with a fine collection of rare French coins which he collected while serving in World War I.—As a part of the Christmas decorations the pharmacy students arranged a crib which brought to the attention of the student body that the gifts of the Magi to the Christ Child included two modern drugs, frankincense (olibanum) and myrrh.—A perusal of the Loyola (New Orleans) Maroon shows that the pharmacy group is doing its full share and more, in the development and maintenance of the university's athletic program.

State University of Iowa, College of Pharmacy.—The American Foundation for Pharmaceutical Education scholarships will be awarded by vote of the faculty at the opening of tre students second scholastic year. No student will be eligible with a grade average less than 2.75 points.—The Ford Hopkins scholarship of $138 (tuition) annually is awarded on the same point basis to the most deserving student who has completed the first year course.—In addjtion 10 prizes are given for excellence of scholarship in various fields.

University of Maryland, School of Pharmacy.—Irvin Friedman won the prize for the best paper in the national pharmacy week radio broadcast for college students. It is planned to have Mr. Charles R. Bohrer, chairman of the national pharmacy week, present the war bond to the winner at a meeting arranged later.—The Wm. S. Merrill Company has donated $1500 to finance a research fellowship in pharmaceutical chemistry to be selected from graduate students now registered in the school.—Another gift of $1000 to be used for research was made by Mr. Gustavus A. Pfeiffer, president of the Wm. R. Warner Company. The gift was suggested by Dr. Charles L. Armstrong, Maryland representative of the Hudnut Sales Corporation, which is an affiliate of the Warner Company and by Mr. Thomas R. Offenbacker, who represents the Warner Company in the Maryland area.

Massachusetts College of Pharmacy.—Dr. Chester S. Keefer, who by the authority of the National Research Council, allocates all of the penicillin productions of the country, was one of the speakers at the joint meeting of the Eastern Association of Physics Teachers, the New England Association of Chemistry Teachers and the New England Biological Association held at the college on December 4.—Dr. E. Fullerton Cook was the guest speaker at the December meeting of the student branch of the A. Ph. A. His subject was, "The Pharmacopœia Goes to War."—The graduate scholarships recently established by Buffington's Inc., pharmaceutical manufacturers of Worcester, has been awarded to Gilman N. Cyr and the undergraduate scholarship of Brewer and Company of the same city has been given to Charles E. Hughes.

University of Minnesota, College of Pharmacy.—Nineteen seniors received degrees at the end of the fall quarter.—Forty-eight students enrolled for the winter quarter.—New members in Rho Chi are Hermina J. Gaul, Doris Shelley and Alfred J. Breneman.—Gertrude M. Horn who was awarded the Doctor's degree in December is now with the research department of Burroughs Wellcombe and Company. On the same occasion Arnold C. Neva and Edwin H. Carlson were given the Master's degree.—Edwin J. Olson, graduate teaching assistant, has joined the Navy. —On January 10, 11, 12, the Minnesota board of pharmacy gave the semi-annual examination for licensure in Wulling Hall.—Dr. Charles V. Netz has assumed the duties of Executive Secretary Slocumb of the Minnesota Pharmaceutical Association pending his recovery from a severe illness.—The members of the faculty are preparing to participate in the program of the scientific and practical section of the 60th annual meeting and war conference of the state association to be held in St. Paul in April.

University of Montana, School of Pharmacy.—On November 2, Dean C. E. Mollett gave a talk over KGVO on "Some Highlights in the World of Pharmacy." He discussed the contributions of pharmacists to the production of medicine through the centuries and stressed especially the part drugs play in modern warfare. He mentioned the progress that has been made by the establishing a Pharmacy Corps in the Army and of the creation of the American Foundation for Pharmaceutical Education in order to give greater support to our educational program.

Ohio State University, College of Pharmacy.—A class of twelve was graduated at the end of the last quarter. Marie Cummins finished with cum laude and was granted the Merck award for excellency in pharmacy. The other Merck award went to Eileen Peel for excellency in materia medica.—Three graduate assistantships, one each in pharmacy, pharmaceutical chemistry, and materia medica are open at the present time. Applications should be made to the dean.

University of Oklahoma, School of Pharmacy.—The fall semester opened on November 6, with an enrollment considerably larger than that of the preceding eight weeks session.—Dr. Ralph Bienfang spoke before the Cooperative Club of Oklahoma City on November 9, on the subject of "Odors."—There has been set up in the pharmacy library a display representing military pharmacy. It comprises military pharmaceuticals and the available literature on military pharmacy.—A complete display

of pharmaceuticals, as produced by the Armour Laboratories of Chicago has been received. These items will be made use of as stock in the practice drugstore, in the military pharmacy display, and as a nucleus for a practice hospital pharmacy stock.—The American Foundation for Pharmaceutical Education scholarships for the current semester have been awarded to Louise Pose, Lucile Watkins, Will J. Pumell, Jr., and Robert Othellow Merriott.—Four students were graduated at the mid-winter commencement in December.—Prof. Ina Griffith spoke before Sorosis, January 12, on, "From Coal to Miracle Drugs."

Oregon State College, School of Pharmacy.—The Oregon Academy of Science was organized at a meeting held in Corvallis in October. Delegates of nearly all the colleges and universities in the state and representatives of state industries and of most of the federal and state departments were in attendance. The initial move toward the organization of the academy was undertaken at the fifth annual Biology Colloquim last April. Dr. F. A. Gilfillan, formerly on the staff of the school of pharmacy, now dean and director of science in the State System of Higher Education, was chairman of the Academy organization committee. Dr. A. L. Strand, president of Oregon State College was elected the Academy's first president.—The academic calendar for civilian instruction of the campus has been synchronized with the ASTP calendar for the year.

Philadelphia College of Pharmacy and Science.—A mimeographed form has been sent to the more than 500 graduates that are in the armed forces asking for certain personal statistics and the story of their experiences to date. As the forms are returned they are placed in a book and after the war it will be bound and made a permanent record of these young people's contribution to the cause for which they fought.—During the period from March 4 to December 7, 1943, forty-one lectures and radio talks were made by members of the faculty to high school and air audiences and various public gatherings. The subjects discussed in each case presented the importance of pharmaceutical service.—Dr. Robert N. Jones, formerly of Pennsylvania State College, has been added to the staff to teach physics and mathematics.—Dr. Jack Feinman, of the pharmacology staff, has been granted leave to serve as Public Health Officer at Wilmington, North Carolina.—At the November commencement degrees in course were conferred upon 67 graduates. Dr. Theodore J. Klumpp, president of the Winthrop Chemical Company, gave the commencement address on "Our World of Tomorrow." He was also granted the degree of Doctor of Science, honoris causa. Honors and prizes for distinguished scholarship were awarded to Kenneth C. Patton, Morton Gibbs, Francis J. DePanfilis, Eleanor Jaspan, Peter L. Bograrosh and Sylvester B. Kempinski.

University of Pittsburgh, College of Pharmacy.—Dean C. Leonard O'Connell, on November 2, spoke over WCAE on the subject, "The Modern Drug Store." He called attention to the fact that the present drug store is a far cry from the apothecary shop of a generation or two ago and stated that one should remember that the modern drug store which is a typical American institution grew out of the needs of the age and is what it is because the people want it that way. The difference, however,

between the modern store and the old apothecary shop exists chiefly in the externals. The preparations of drugs to be used in the modern treatment of disease has become a science demanding a most extensive training and the most exacting scientific principles administered under legal supervision. He closed by saying "without respect to the number and variety of non-professional activities in the drug store the pharmacist in his professional relation still remains a purveyor of drugs and medicines to physicians and their patients."

Purdue University, School of Pharmacy. — Eight assistantships and seven fellowships are available for the coming year. They are open to men and women holding the Bachelor's degree in Pharmacy and with excellent undergraduate records. The appointments are for twelve months with one month vacation and are subject to reappointment if their work is satisfactory. All appointees pay regular graduate fees of $40 per term with remission of non-resident tuition. Assistantships pay $1080 a year and require one-third time teaching duties and two-thirds time graduate work leading to the M. S. or Ph. D. degree. Fellowships carry the same remuneration with full time for graduate work leading to the M. S. or Ph. D. degree. Candidates with previous graduate work are given preference in fellowship appointments. Graduate work is offered in pharmacy, pharmaceutical chemistry, pharmacology and pharmacognosy. These assistantships and fellowships do not carry deferment under the Selective Service Act other than that provided for men engaged in graduate work and scientific research. It is particularly important at this time to continue the training of superior students in pharmacy so that they may be available as replacements for those lost to the industry and the armed services in recent years. Formal application blanks may be secured from the dean.

University of Southern California, College of Pharmacy.–Professor Willard G. Smith is serving on the California Pharmacists' Selective Service Committee.—Profs. Brady II and Smith have been teaching classes in navigation, mathematics and physics in the Navy trainee program in addition to their regular classes in pharmacy.—The enrollment for the current semester consists of 25 women and 31 men.—Captain Clarence T. Smith, 1931, formerly an instructor in pharmacy is now in the Army's chemical warfare service.—Lamda Kappa Sigma has begun the publication of a mimeographed news sheet. It is edited by the women pharmacy students.—On December 30, the Army-Navy "E" was awarded to the A. R. Maas Chemical Company. Mr. Maas was formerly professor of pharmacy in this institution and in his instructional work he stressed the commercial application of the basic training given in college with great success and to the advantage of his students. Many products of commercial importance have been developed in his laboratories and the moving picture industry owes many of their "fake" effects to his chemical ingenuity.

Medical College of the State of South Carolina, School of Pharmacy.—Dr. Robert Wilson, after having served as dean for a period of thirty-five years was retired on December 7, with the title dean-emeritus, professor emeritus of medicine and special lecturer on medical history. Dr. Kenneth M. Lynch, professor of pathology and a graduate of the Univer-

sity of Texas, was elected dean.—Director W. A. Prout represented the school of pharmacy at the November meeting of the South-Eastern Pharmaceutical Conference at Atlanta.—On November 10, the Kappa Psi fraternity was reinstalled. The grand officers performing the ceremony were Dean Leonard O'Connell, Prof. Ray S. Kelly and Dr. A. J. Schwartz.

Temple University, School of Pharmacy.—Dr. James C. Munch who has been conducting experiments for the Department of the Interior to find antidotes for warfare gases believes that gas will be used to a greater extent in the coming months of the present war than it has to date. When armies are on the retreat gas is a most effective method to delay pursuit. As a consultant on the Federal Bureau of Narcotics in 1933, Dr. Munch developed the present widely used "saliva test" to determine whether race horses have been given drugs.

Medical College of Virginia, School of Pharmacy.—Nine students, five of whom were girls, a record percentage, were graduated December, 1943.—Rho Chi and the Mortar and Pestle Club held their annual dinner at which awards were announced. Prizes for excellence in scholarship went to Martha Goodwin, Edward Truitt, Camilla Jeffers and Jean Webber.—Recent initiates in Rho Chi are Richard H. Kirkland, Forrest W. Pitts, Edward B. Truitt, Jr., Martha Goodwin.—The 1944 session began on January 6. Classes were limited to sophomores, juniors and seniors. Freshmen will not be accepted until the beginning of the summer quarter early in July.—Doris Vermilyea has resigned as instructor in pharmacy and Martha Goodwin has been appointed in her place.—During the past quarter members of the state department of agriculture and the department of entomology gave lectures on insecticides to the upper classmen. The plans are to enlarge upon these lectures during the present session.—During the past quarter, also, Drs. Rowe and Kaufman gave lectures to the sophomore medical students on the proper ways of writing various prescriptions primarily to enable students to write prescriptions correctly and to familiarize them with the use of official preparations and drugs.

State College of Washington, School of Pharmacy.—A scholarship established by the Spokane Woman's Auxiliary of the Washington State Pharmaceutical Association has been awarded to Robert Race of Ketchikan, Alaska.—Marjorie Ratho, Ellis Bull, Richard Hampton, and Edward Saldin have been awarded the American Foundation for Pharmaceutical Education scholarships.—Both undergraduate and graduate scholarships and teaching assistantships are available for the next school year beginning in September. Applications should be sent in as soon as possible.—The local student branch of the A. Ph. A. has secured nearly 100 per cent membership in the student body. Several programs have been held and among the speakers have been two former graduates, Theron Duerfeldt, now with Lederle and Ronald Robertson, Spokane pharmacist and former president of the state board of pharmacy.

Miscellaneous Items of Interest

A. A. C. P. Bulletin No. 1

The Association members will recall that Dean Kuever, during his term as President, released bulletins from his office directing attention to such events and committee activities as was deemed of special interest to the colleges. It furnished an expedient means of contacting the members and informally advising them on such matters as seemed important. A considerable number of the Association members have given favorable expression to Dean Kuever's method of communication.

With this acknowledgment, bulletins will be mailed out during the year, if and at such times, as they may appear useful.

It is a pleasure to report that all committees have been appointed and acceptances received. Appreciation is expressed to all committeemen who have generously undertaken added duties and responsibilities. It has been gratifying to receive letters from committee chairmen and members giving evidence of their deliberations on many problems.

The War Emergency Committee is vigorously at work. The recent questionnaire from the chairman of the Executive Committee has been sent to all member colleges in order that the wishes of each may guide the committee in their activities. No doubt all have replied to Chairman Christensen's request for the necessary information.

The objectives of a committee can be most nearly reached if each member will freely and generously interchange his thoughts and ideas with his co-workers.

11-5-43 Forest J. Goodrich, President

A. A. C. P. Bulletin No. 2

An alarming situation again faces our Association and the profession. An amended directive issued by the WAR MANPOWER COMMISSION has taken from us at this time the opportunity of preparing young men for a professional service which is most essential to the civilian population and the Armed Forces. More men are to be taken from the ranks of the practicing pharmacists, yet but few will be trained to replace them. After July First of this year, our schools and colleges will no longer be asked to take part in preparing qualified pharmacists for the military forces.

The Chairman of the War Emergency Committee has indicated clearly in the following report the effort put forth by his committee, together with members of the War Advisory Committee of the A. Ph. A., to obtain favorable terms of deferment for pharmacy students. These men who have been giving unsparingly and unselfishly of their time deserve our sincere appreciation and must be assured of our hearty support for the work ahead.

Forest J. Goodrich, President

WAR EMERGENCY COMMITTEE, AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

W. F. Rudd
G. L. Jenkins
H. C. Muldoon
A. G. DuMez, Chairman
F. J. Goodrich, Ex Officio
B. V. Christensen, Ex Officio

SUBJECT: Review of work of the Committee up to January 27, 1944.

On September 20, 1943, Dr. Kelly and the Chairman of your Committee interviewed officials of Selective Service to obtain certain information for the American Council on Pharmaceutical Education, including information relative to the prospects for securing an extension of the period of deferment of pharmacy students to three years. We were informed that the concensus of opinion throughout the country, as revealed by the field agents of Selective Service, was that there should be no deferment of college students and that the time was inopportune to request an extension of the period of deferment of pharmacy students.

On December 9, after Dean Christensen, Chairman of the Executive Committee of the American Association of Colleges of Pharmacy, informed the Chairman of your War Emergency Committee of the result of the vote on what the member-colleges desired the Committee to do, Dr. Kelly was immediately contacted and requested to approach Dr. Elliott's successor in the War Manpower Commission and the proper officials of Selective Service to determine if something could not be done to secure better terms for the deferment of pharmacy students. This was just about the time the excitement over the drafting of pre-Pearl Harbor fathers had reached its height and Dr. Kelly was advised to wait until after it had been definitely determined what would be done about the drafting of these fathers. One of the results of this controversy was that Congress passed a law separating the War Manpower Commission and Selective Service.

Shortly before Christmas, information was received that Occupational and Activity Bulletin No. 33-6 of Selective Service was to be rewritten and that the privilege of being considered for deferment would be withdrawn for most students. Upon receiving this information, your Chairman requested Dr. Kelly to contact the various Government agencies concerned to determine what was being done in this respect. In response to this request, Dr. Kelly made inquiries and found that National Scientific Roster was then making studies of the personnel needed in the various professions and industries for the purpose of making recommendations to Selective Service and to the Essential Activities Committee of the War Manpower Commission. Following the receipt of this information, Dr. Kelly contacted the office of National Scientific Roster and secured an interview with the Assistant to the Director. In this interview, Dr. Kelly was informed that the officials of National Scientific Roster were fully acquainted with the difficulties confronting pharmacy but that they were still of the opinion that additional pharmacists could be taken by the draft without creating a critical shortage, provided the pharmacists in active practice would give most of their time to the dispensing of drugs and

medicines and the sale of sick room supplies and would not devote so much of their time to extraneous activities, such as lunchroom service, beverage service and merchandising. At the conclusion of the interview, Dr. Kelly was informed that National Scientific Roster would give consideration to the information which he had given them and that they would give him an opportunity for another interview, at which a representative of the colleges would be present. However, Scientific Roster did not call Dr. Kelly again.

Following the interview which Dr. Kelly had with officials of Scientific Roster, the Chairman of your Committee on War Emergency waited about ten days and then went to Washington to talk the matter over with Dr. Kelly to determine what, if anything, could be done to cause Selective Service to reach a favorable decision with respect to granting pharmacy students further deferment privileges. At this time, the various governmental agencies concerned with the draft were again contacted and we were definitely informed that Occupational and Activity Bulletin No. 33-6 was in the process of being rewritten, that the deferment of practically all students would be withdrawn, except for the pre-professional students and some students in chemistry, physics and engineering.

All of the officials who were contacted gave as their opinions that it would be a waste of time to ask that the education of pharmacy students be made a part of the Army and Navy training programs at this time. These officials expressed the opinion that as long as the armed forces could obtain the number of pharmacists needed through the draft, there was no possibility of either the Army or the Navy setting up programs of training for pharmacy students.

The foregoing information was sent to all members of the War Emergency Committee of the American Association of Colleges of Pharmacy on January 6, 1944.

On January 7, a copy of the revised draft of Selective Service Bulletin No. 33-6 was obtained. Under the provisions of the revised draft, which will become effective February 15, 1944, consideration for deferment privileges is withdrawn for all able-bodied male pharmacy students, except students in the senior class who can graduate before July 1, 1944.

At the request of the Chairman of your War Emergency Committee, Deans Christensen and Rudd met in Washington with Dr. Kelly and your Chairman to discuss the situation and to determine what action, if any, should be taken by the Committee. After a thorough review of the situation, it was decided to interview the appropriate governmental agency to request that the pharmacy colleges be given a reasonable quota of the students made eligible for deferment under the revised regulations. Arrangements were, therefore, made with Selective Service for an interview. This interview was attended by Dr. Kelly, Dean Christensen and the Chairman of your Committee as Dean Rudd had to leave before the time arranged for the interview.

At this interview, the Committee was courteously received and the statements made by the officer interviewed were both frank and positive. In substance, he informed the Committee that Selective Service had

fallen behind in its quota of draftees for the last three months of 1943, that it was necessary to raise one million men for the armed forces during the first six months of this year and that to obtain these men, it was necessary to withdraw deferments for all students, except those in a few specialized groups which were needed by the armed forces. He stated further that the deferment privilege for pharmacy students was withdrawn because the armed forces did not need any more pharmacists to perform pharmaceutical work and on the grounds that there was still a sufficient number of civilian pharmacists in active practice to adequately serve the needs of the public. As a result of the interview, the Committee was convinced that there was no probability of Selective Service reconsidering its decision on the matter in question.

It is the opinion of your Chairman and of Dr. Kelly, Chairman of the American Pharmaceutical Association War Emergency Committee, that nothing more can be done at the present time to secure deferment privileges for pharmacy students. The only means of attaining this objective, which was not made use of, is that of bringing political pressure to bear, and it is doubtful if such pressure would have the desired effect at this time when fathers are still being drafted.

In view of the foregoing, it appears that the colleges of pharmacy may expect local draft boards to begin drafting pharmacy students on or after February 15, except senior students who can graduate before July 1. This will leave available for the colleges male students classified as 4F's and the girls. In addition, it is probable that some of those who are now being returned to civil life from the armed forces for various reasons, will decide to go to college. According to Selective Service, 75,000 to 100,000 men are now being let out of the armed forces monthly. What proportion will decide to begin college work or to return to college is not known at the present time and will probably be determined largely by the legislation, if any, which is enacted by Congress to defray the expenses of such students.

Baltimore, Maryland,
January 27, 1944

A. G. DuMez, Chairman,
War Emergency Committee

The 1943 Plant Science Seminar

The Twenty-First Annual Plant Science Seminar was held at the college of pharmacy of Ohio State University at Columbus, September 7-8, 1943. Dr. L. David Hiner, as local secretary, arranged a most excellent program. Being a year of streamlining, the Seminar "followed suit" with the American Association of Colleges of Pharmacy and the American Pharmaceutical Association and condensed its usual program of a week's duration into two days. The condensation was singularly successful in that it sampled every feature of the customary weekly program. In addition it was most unique, in that it was the first meeting of the Seminar in which students took an active part.

Briefly the program was as follows:* Five sessions were held. Fol-

*The detailed program will be found in the Abstract of Proceedings. Jour. A. Ph. A. (Scientific Edition), XXXII (1943), 443-446.

lowing a brief chairman's address by Dr. A. John Schwarz and a welcome by Dean B. V. Christensen, the first session was devoted to a lecture with kodachromes by Dr. Arthur E. Schwarting on, "A Medicinal Plant Survey of Ohio." The second session was devoted to talks by Dr. Alex Laurie and Mr. Willis Brewer on "The Drug Cultivation Project," and a visit to the greenhouses and the medicinal plants garden. Returning at four o'clock the Seminar listened to a delightful talk, illustrated with kodachromes by Mr. Woodrow R. Byrum on, "The Forest Rose Legend of Christmas Rocks," one of the early Indian legends of Ohio. After a brief recess the Seminar convened at dinner in Pomerene Hall. The third session was devoted largely to an illustrated lecture by Dr. Edward S. Thomas on, "The Lure of the Sandstone Country."

After an early morning lecture Wednesday, by Dr. Grant S. Stahly on "Penicillin," the Seminar left for an all-day field trip visiting many places of botanical interest. The trip was most complete even to the traditional Schwarz watermelon party. The fifth, and final business session was held Wednesday evening. Officers elected for the 1944 Seminar are: chairman, Learny F. Jones, Indianapolis, first vice chairman, Frank J. Slama, Baltimore, second vice chairman, Edward P. Claus, Pittsburgh, secretary-treasurer, Elmer H. Wirth, Chicago, members of the executive council, John E. Seybert, Indianapolis, and A. John Schwarz, Memphis. Round table discussions on drug markets, drug cultivation and standards concluded the meeting. Between fifty and sixty members and guests attended.

The success of the twenty-first meeting was due, in a considerable measure to the participation of students. Because of the accelerated program and their presence on the campus Dr. Hiner had asked the student branch of the American Pharmaceutical Association to cooperate with, and take part in the Seminar. This the students did enthusiastically; they rendered transportation and guide services on the field trip, they took part in the programs, prepared exhibits of drug plants, furnished excellent entertainment and made themselves generally useful in all capacities. The benefits thus rendered the visiting seminarians were many and added greatly to the pleasure of the visit.

This was all very nice and received the plaudits and appreciation of the visitors. The surprising thing, however was the reaction of the students themselves. They all had a fine time and were surprised and delighted to find that the names they knew from text-book fly-leaves and journal articles were after all, humble human beings, friendly, harmless and as easy to talk to as the boy in the next seat in the classroom. They were no longer names—but personalities. Personalities not much different from themselves, who had perhaps accomplished something that they too might accomplish. In short, personalities with which they had, after all, much in common. In so many words they expressed their enthusiasm to me. They felt, in fact, that they, rather than we, the visitors, were on the receiving end. They further expressed the thought that the Seminar had been to them a source of stimulation to learn more of, "just what was going on in American pharmacy."

With all this enthusiasm, the thought occurred to me, that perhaps we have neglected the students' participation in most of our national affairs. True, many colleges have student branches of the American

Pharmaceutical Association, and these branches are often very active locally. In our own District, 4, the student branches send delegates to a student meeting held simultaneously with that of the boards and colleges. But this is not exactly participation. How many students participate in our national conventions? Just informally meeting the leaders in American pharmacy seems to mean so much to these boys and girls. And then, why should they not take some active part in national meetings? From their ranks will come the leaders of tomorrow.

Student interest and participation is by no means automatic. The seed must be planted. In the case of the 1943 Seminar it was Dr. Hiner who planted this seed. In his lectures in pharmacognosy he no doubt discussed the U. S. P. and the N. F., how monographs were written, who wrote them, who was contributing what, to the cultivation of medicinal plants, to the standardization of vegetable drugs and to their pharmacognosy in general. Thus names were associated with facts, and it remained for the Seminar meeting to translate names into personalities and thus open a new door for enthusiastic endeavor.

I wonder how many teachers discuss the history of and the present-day progress in their fields, and the men who contribute to this progress. Is it not a seed that should be planted by all of us? Perhaps the Seminar by virtue of its informality served as an ideal medium for student cooperation and participation. In, other and more formal meetings success might not be as marked. Still, I believe that we might all do well to give the idea some thought and attention.

Elmer H. Wirth, Secretary

Opportunities for Pharmacists in the Food and Drug Administration

In response to inquiry and so that pharmacists and pharmacy students generally may know of the opportunities for pharmacists in the Food and Drug Administration of the Federal Security Agency, George P. Larreck, Chief Inspector, has recently issued the following statement:

"We have for the past several years lost professional personnel at a rate of about seventeen per month. The loss has not been quite so great recently, primarily because all personnel who held reserve commissions in the armed forces have now been called and a great many of our younger men for whom we have not obtained occupational deferments have already entered the armed forces. While we do not therefore anticipate as large a turnover as has taken place in the recent past, we nevertheless do expect to have further vacancies for which qualified pharmacists are eligible.

"These vacancies fall in two classifications. We maintain laboratories in sixteen of the principal cities of the United States where samples of foods, drugs and cosmetics are analyzed. The analytic work performed ranges all the way from simple determinations of the compositions of foods like butter to the most complex chemical assay of pharmaceuticals. We do not expect chemists when they are appointed to be

competent to analyze this wide variety of products, but they are required to have had a good fundamental education in chemistry upon which background they can be further trained. Quite naturally a number of chemists tend to specialize in different fields of analysis, but we have found it to be particularly advantageous to employ a substantial number of men and women well trained in pharmaceutical chemistry. In addition to the straight analytical work, persons showing capabilities are given opportunities to do some research work such as seeking to develop improved methods of analysis, and the personnel is also required from time to time to testify in cases brought in Federal courts concerning the results of their analyses. They also occasionally make investigations in manufacturing establishments.

"We also maintain a staff of about two hundred inspectors, who likewise are assigned to headquarters in sixteen principal cities. On the average the station territory covers three states, and inspectors are in a travel status about half their time. These men make thorough factory inspections of manufacturing plants engaged in the production of foods, drugs, and cosmetics. They deal with the quality of the raw materials used, the sanitary conditions in the plant, the manufacturing processes employed, the laboratory and other controls exercised, particularly by firms engaged in the production of pharmaceuticals, and with the labeling employed on products shipped in interstate commerce. They collect representative samples of merchandise found in commerce and make a wide variety of special investigations such as those involving food poisoning as well as drug and cosmetic injuries. They too testify in Federal courts concerning their work.

"Before the war the Civil Service Commission required that applicants for this position should be graduates of a recognized college and that they should have a major in one of the basic sciences. Four-year pharmacy students were eligible for these positions. Because of the man-power shortage the educational requirements for inspectors have been somewhat relaxed. We are now at liberty to appoint capable men who have as little as three years college training. It is quite probable, however, that at the termination of the emergency the original professional qualifications will be required. In addition to the educational requirements, it is particularly important that inspectors should be possessed of personality traits which will permit them to represent the Government creditably.

"In the case of both inspectors and chemists appointments are ordinarily made initially to the P-1 grade. The basic salary for this position is $2,000.00 per year. Congress has however provided a temporary wartime increase of $433.00. We regard the P-1 grade as a training grade. If the individual is successful and funds are available, it has been our practice to reallocate him to the P-2 grade, the basic salary of which is $2,600.00. In the case of the majority of men, this reallocation has taken place before the end of the second year. All appointments to Civil Service positions in the Government now are made on a temporary wartime basis; that is, the appointments are for the period of the war and six months thereafter. We do not know whether or not these positions can be made permanent at the end of the war, but it certainly will be our purpose to take every proper step to bring this about in the case of those individuals whose performance is outstanding."

Report of the Committee on the Status of Pharmacists in the Government Service*

September 9, 1943, Columbus, Ohio

Last year's report was greatly lengthened by the activities of your committee in Selective Service matters as they affected pharmacists. The appointment of the War Acivities Committee relieved our committee of those and related negotiations about November 1st; therefore, we will report only the duties which claimed our attention throughout the year.

Veterans Administration. This already important bureau unfortunately will probably be greatly enlarged as a result of the present conflict.

At present the Administration's Tables list 120 pharmacist positions. Ninety-five of these start at P & S-1 grade; entrance salary, $2000. There are 25 positions as pharmacist's assistant, SP-4; entrance salary, $1620. At the majority of the facilities but one pharmacist is in attendance. At 18 of the installations the pharmacist has from 1 to 4 assistants, the total number being governed by the size and type of the facility.

Since it has been the policy to start the pharmacist at $2000, P & S-1, whether the size of the facility requires assistants or not, a suggestion was made that pharmacists in charge of a facility of sufficient size as to require several assistants, be given a rating of P & S-2, starting salary, $2600. The Civil Service Commission has looked with favor upon this proposal and, after additional study of the work done in these pharmacies, it is believed it will be approved by the Classification Service of the Veteran's Administration.

A bill, H. R. 8220, has been introduced in the House "to provide for the establishment of a permanent Medical Corps in the Veteran's Administration." It "shall constitute a component part of the military forces of the United States, and service therein shall be deemed active military service for all purposes." It provides for the commissioning of 2834 physicians and dentists and 5541 nurses and such other commissioned, non-commissioned, enlisted personnel, and civilian employees as may be deemed necessary by the Administrator.

Pharmacists are mentioned in Section II. "The Administrator shall establish and maintain a Medical Reserve Corps of officers and enlisted personnel to which there shall be appointed physicians, dentists, pharmacists, technicians, nurses, dietitians, and such other personnel found qual-

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*The members of the committee and the organizations they represent are as follows:

David B. R. Johnson, Henry S. Johnson, and Charles H. Rogers,—American Association of Colleges of Pharmacy.

Hugh P. Beirne, Rowland Jones Jr., and Roger W. Lusby,—National Association of Retail Druggists.

Robert L. Swain, A. H. I. Winne, and Charles R. Bohrer,—National Association of Boards of Pharmacy.

B. Tappan Fairchild, Frank L. McCartney, and H. Evert Kendig, Chairman,—American Pharmaceutical Association.

ified on examniation in such numbers and ranks as are deemed necessary by the Administrator to fill any vacancies or meet any emergent conditions."

This bill was referred to the Committee on World War Veterans' Legislation. So far, hearings have not been held. Your committee is giving due attention to these matters.

Indian Bureau. If the rating of P & S-2, to which I have referred to approved for the Veterans' Administration, such action will open the way for satisfactory negotiations for appointments in this grade in the Indian Bureau and in other governmental bureaus and agencies requiring the services of pharmacists.

Public Health Service. You will recall that when the Parker Bill was enacted, 10 pharmacists were commissioned in the Public Health Service, the other pharmacists remaining on Civil Service Status. It was understood that the number of commissioned pharmacists would be maintained but this has not been done. Your committee has made appropriate representations to the Surgeon General of that service.

Some months ago, legislation was introduced in Congress providing for a general reorganization of the Public Health Service. The bill with amendments has passed the Senate but has not received action in the House. Your committee has followed the progress of this legislation and expects that the status of pharmacists will be given further and favorable consideration before the bill is finally passed.

Your committee is receiving the advice and assistance of pharmacists and Congressman Harve Tibbett of Pennsylvania, a member of the committee to which the bill was referred and a member of the sub-committee which has the bill in charge.

The Navy. Some years ago, the committee decided to concentrate first on placing a Pharmacy Corps in the Army and then give consideration to the pharmaceutical requirements of the other branches of the armed forces.

At the last meeting of these associations, the Committee was authorized to contact the Navy and this was done. The Committee wishes to report that negotiations with respect to the situation in the Navy are in progress and the results will be reported at an appropriate time. The committee is confident that the membership will understand that progress only can be reported at this meeting.

The Army. Pharmacy Corps Bill. At the Denver meeting, 1942, of these associations, we informed you that a Steering Committee for the Pharmacy Corps was authorized and appointed at the meeting of the Committee held at the Union League Club, Philadelphia, in May 1942. It was charged with the duty of projecting and planning the procedures deemed necessary to bring about passage of the Pharmacy Corps Bill and with the practical carrying out of the plans devised. In other words, the strategy and tactics.

The report of the Steering Committee for the Pharmacy Corps Bill made to your committee which is now reporting, sets forth in proper sequence the steps taken to effect passage of the Pharmacy Corps Bill and is appropriately introduced at this point.

Report of the Steering Committee for the Pharmacy Corps Bill Submitted to the Committee on the Status of Pharmacists in the Government Service, September 9, 1943, Columbus, Ohio.

We have already reported that on July 23, 1942, the bill, H. R. 7432, to establish a Pharmacy Corps in the United States was introduced in the House of Representatives by Congressman Carl T. Durham of North Carolina, a member of the House Committee on Military Affairs, August 3rd, the same measure, numbered S. 2690, was introduced in the Senate by Robert R. Reynolds, Senator from North Carolina, Chairman of the Senate Committee on Military Affairs.

Early in September, following the meeting of your committee held in August 1942, at Denver, Colorado, the Secretary of War informed the House Committee on Military Affairs, to which our bill had been referred, that the War Department was opposed to H. R. 7432 and it desired to be heard in opposition to the bill. We then requested permission to present reasons why the bill should be passed and prepared a program for the presentation of testimony.

Due to the many bills of importance under consideration by the House Commitee on Military Affairs, the Committee was not able to schedule hearings on the Pharmacy Corps Bill until November. On the eleventh of that month, Chairman Andrew J. May set Tuesday, November 17th, and Tuesday, November 24th, as the days for the hearings, the War Department to testify on the 17th and those in favor of the bill on November 24th.

Brigadier General McAfee, Assistant to the Surgeon General, represented the War Department at the hearings held November 24th and told the Committee why the Department was opposed to such legislation. General McAfee's testimony appears in the official record of the hearings attached as a part of this report.

The members of the Steering Committee attended the hearings as observers. After listening to the testimony, they were convinced that the opposition of the Medical Department of the Army was not supported by convincing facts, and felt that a large majority of the members of the Committee on Military Affairs shared their opinion.

Prior to the hearings, your committee took appropriate measures to inform the members of the Committee on Military Affairs of the reasons for introducing H. R. 7432 and the advantages which would accrue to the Army by passage of the bill.

The general plan adopted by the Steering Committee to enlighten the members of Congress about the desirability of this legislation, and to have them informed by the pharmacists of the country of their keen interest in this bill, was set in motion about this time. The program was comprehensive and utilized the full power of the four national associations represented on your committee, other national associations interested and willing to join in the effort, and the State Pharmaceutical Associations. Through those national and state associations we informed the county and city organizations and ultimately the individual pharmacists of their part in the movement. Eighteen major activities

were listed for the guidance of those interested. Copies of the details of our program for eliciting the necessary support are attached as part of this report.

Due to illness in the family of the Chairman of the Military Affairs Committee, the hearings set for November 24th, for the purpose of receiving the testimony of the proponents of the legislation, were postponed. Re-scheduling was not possible prior to the final adjournment of the 77th Congress.

Promptly after the convening of the 78th Congress in January 1943, the Pharmacy Corps Bill was reintroduced in the Senate by Senator Robert R. Reynolds, receiving the number 216, and in the House of Representatives by Congressman Carl T. Durham as bill No. 997. The bills were referred to the respective Committees on Military Affairs.

New members had been appointed to both Committees on Military Affairs and the necessary steps were taken to acquaint them with the merits of the bill and to obtain their interest and support. Copies of the roster of membership of both committees in the 77th and 78th Congress are attached as part of this report.

February 11, 1943, at the request of Congressman Durham, Chairman May informed your committee that a hearing on H. R. 997 before the House Committee on Military Affairs had been set for Tuesday, March 2nd, at which time the proponents of the Bill would be heard.

All arrangements, including the list of speakers, had previously been made by the Steering Committee with the approval of the general committee. You will recall that a meeting of the Committee on the Status of Pharmacists in the Government Service was called by the Chairman for Monday, March 1, to be held in Washington at which meeting the various papers were read and suggestions for strengthening them were made. The entire procedure for the hearing was carefully revised and approved.

The general plan included:

1. A statement by the Chairman, H. Evert Kendig, to summarize the purposes of the pending legislation and to reply to and refute much of the testimony presented by the representative of the War Department at the hearing held November 17, 1942.

2. Detailed information concerning the education and training of a pharmacist, by Dean Howard C. Newton, Presdient of the American Association of Colleges of Pharmacy.

3. The legal safeguards effective in the forty-eight states to protect the public in respect to the qualifications of individuals granted the legal right to practice pharmacy, by Dr. Robert L. Swain, representing the National Association of Boards of Pharmacy.

4. An explanation of the Bill and the belief of organized pharmacy in the necessity for its approval by Congress, by Dr. Roy Bird Cook, President of the American Pharmaceutical Association.

5. A discussion of the flagrant waste of manpower to not use registered pharmacists for the drug functions in the Army, and the danger of permitting improperly trained men to dispense dangerous and po-

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tent drugs, by Rowland Jones, Jr., Esq., representing the National Association of Retail Druggists.

6. The demand of veterans of World War I that the bill be passed expressed in a resolution adopted by the American Legion at its 1942 meeting, by Francis M. Sullivan, Director of the National Legislation Committee of the Legion.

7. Views of a pharmacist based on observation and practice of pharmacy in civilian life and in the Army by Major Arthur H. Einbeck.

8. Views of a physician who served as a medical officer in World War I and who because of his official position could reflect the sentiment of the general public toward this legislation, by the Honorable Robert O. Blood, Governor of the State of New Hampshire.

At the hearings this program was adhered to with a few necessary deviations. A considerable portion of the testimony had to be submitted in the form of briefs because of lack of time for oral presentation.

Due to illness in the family of Governor Blood, he could not be present and submitted a statement presented by Congressman Foster Stearns of New Hampshire.

Congressman Chester E. Morrow, of New Hampshire, presented a resolution adopted by the Legislature of that state endorsing the Bill. Similar resolutions passed by other states, including Oklahoma, Maryland and California, were introduced for the record.

Congressman Harve Tibbett and Congressman John C. Kunkel of Pennsylvania and Congressman Hubert Ellis of West Virginia, also voiced their support of the legislation. Congressman Tibbett presented a resolution adopted by the Cambria-Somerset Retail Druggists Association of Pennsylvania urging the enactment of the Bill.

Demonstrating not only their interest in the subject, but their desire to give careful study to the facts, the Congressmen asked many questions on the requirements to practice pharmacy in civilian life and the present lack of adequate safeguards around pharmaceutical service in the Army.

Congressman Ivor Fenton of Pennsylvania, a member of the Military Affairs Committee and a physician who served in the Army in World War I, made a particularly strong statement in support of the bill.

An abstract of the hearings and an official copy of the hearings are attached as part of this report.

Three months elapsed before the Committee on Military Affairs voted on the bill. Your committee anticipated favorable action by the House Committee, and during this period activated its entire program and, as the later results showed, effectively and convincingly brought the merits of the measure to the attention of the members of the Congress.

May 21, the Committee on Military Affairs submitted a report to the House on their consideration of the bill "with the recommendation that it do pass." The bill, H. R. 997, with the report prepared by Congressman Durham, was submitted to the Committee of the Whole House on the state of the Union and ordered to be printed. A copy of the printed report is attached.

Just one month later, June 21, the bill passed the House by unanimous consent.

Senator Reynolds and Congressman Durham had agreed when the bill was introduced in 1942 that the fight should be made in the House first and if and when sucessful, the Senator as Chairman of the Senate Committee on Military Affairs would arrange for hearings promptly if it seemed desirable to present arguments to the Senate. Senator Reynolds accordingly named June 29 as the date for the hearings. We would have rested our case on the testimony presented to the House Committee but the War Department sent word to the Senate Committee on Military Affairs that Brigadier General M. G. White of the General Staff of the Army would appear against the Pharmacy Corps Bill; so we asked to be heard also.

The rapid action between June 21 and July 5 was due to our desires and the efforts of our friends in Congress to pass the bill before Congress recessed for the summer. The Steering Committee had less than a week's notice of the Senate hearings and adopted a plan previously prepared for use in event of being called on such short notice to appear before the Senate Committee. The program called for:

1. An introductory statement by Congressman Durham as the cosponsor of the bill, explaining its general purposes and main provisions.
2. A statement by Chairman H. Evert Kendig explaining how the provisions of the bill would carry out its intentions and a resume of all the favorable testimony presented at the House hearings.
3. Presentation of the American Legion's resolution in favor of the bill by L. S. Ray, Acting Executive Secretary, National Legislative Committee of the American Legion.
4. Endorsement by Congressman Harve Tibbett of Pennsylvania, the other pharmacist in the House of Representatives.
5. Presentation of resolutions passed by State Legislatures requesting the Congress to act favorably on the bill.
6. Filing of briefs and other resolutions.
7. To have present to answer specific questions:

   Dr. E. F. Kelly, Secretary, American Pharmaceutical Association.

   Dr. Howard C. Newton, President, American Association of Colleges of Pharmacy.

   Rowland Jones, Jr., Washington representative, National Association of Retail Druggists.

   Dr. Robert L. Swain, Treasurer, National Association of Boards of Pharmacy (Mr. Charles Bohrer, President, N. A. B. P. substituting in the absence of Dr. Swain).

The hearings proceeded according to plan until General White took the stand and opposed changing the name of the Medical Administrative Corps, stating that in 1936, "it was the view of the Surgeon General that the Medical Administrative Corps could well be abandoned entirely," but "since the beginning of the emergency the Medical Administrative Corps has become one of the most important groups we

have in the Medical Department." Later, he said. "we must have the Medical Administrative Corps."

A free discussion of this matter was participated in by Senators Reynolds, Bridges, Lodge, Johnson, and Gurney; General White; Dr. Kelly and Dr. Kendig. Finally, Senator Gurney suggested that the Medical Administrative Corps be retained and the bill be rewritten to add a Pharmacy Corps. This proposal was freely discussed which resulted in Senator Gurney making a motion. He said, "I move you this bill be reported out as we have just talked, and that the language receive the approval of the chairman of the committee, Senator Johnson and Senator Cabot Lodge, and when it does receive their approval, it be reported on the floor of the Senate as action of the full committee." The motion passed.

Arrangements were made at once for a meeting at 3:00 that afternoon. Representatives of the War Department and of the Senate Committee on Military Affairs met in the Committee's room with Dr. Kelly, Mr. Jones, and Dr. Kendig and proceeded to draft an amendment to the bill to place a Pharmacy Corps in the Regular Army without disturbing the Medical Administrative Corps.

Your Steering Committee insisted that provision be made for the transfer of the 16 pharmacy officers in the M. A. C. to the Pharmacy Corps. This clause was opposed by Colonel Longfellow, a legal advisor who represented General White and the War Department. He finally agreed but said he would have to report back to General White. The conference concluded its draft at 6:15 p. m.

The next morning, June 30th, the War Department submitted a revision of our revision which provided for the transfer of all of the officers in the M. A. C., 16 pharmacists and 42 administrators, to the proposed Pharmacy Corps. We objected strongly to this transfer of the 42 non-pharmacists to the new corps but were advised by Senator Reynolds and Congressman Durham to accept this provision even though objectionable. We were told that unless we agreed to this compromise the bill in all probability would be vetoed by the President at the request of the General Staff.

Senator Reynolds strongly recommended acceptance pointing out that we were obtaining our major objective, a Pharmacy Corps in the Army. He said conditions were favorable for passing the bill before Congress recessed for the summer and that he could promise favorable action not but, if we decided to fight he could not guarantee the same vote in September. Mr. Durham said he could have the amended bill passed in the House as soon as it was received from the Senate.

As you will remember, we telephoned every member of the committee and were able to talk with a large majority of them. The vote of the committee was unanimous to accept the amendment and obtain the Pharmacy Corps.

We informed Senator Reynolds of our decision, and he promptly submitted the bill with the agreed upon amendments to the Senate and it was passed by unanimous consent on July 3rd, and sent to the House for concurrence. The House accepted the amendments and passed the bill on the unanimous consent calendar July 5th.

The bill went to the White House, July 6th, and was signed by the President July 12, 1943, and it became Public Law 130-78 Congress as of that date. A copy of the law is attached as part of this report.

Soon after the bill was signed by the President, we inquired of the Surgeon General as to who would be charged with the duty of activating the Corps and were informed that the organizational matters had been placed in the hands of Colonel J. R. Hudnall. Your committee promptly called on this officer, and rendered assistance in any way in which our organization could be helpful. We were cordially received and discussed the procedures necessary for making the law effective. Captain Donald MacClaire of the Medical Administrative Corps, a legal advisor, participated in the conference.

Since then we have kept in close touch with the Surgeon General's Office and have followed the various steps taken toward organization with constructive interest.

The first important organizational action was the transfer of the Medical Administrative Corps officers to the Pharmacy Corps.

August 19th, the Adjutant General, Major General J. A. Ulio, issued an order that the insignia for the Pharmacy Corps shall be "A Caduceus with the letter 'P' superimposed thereon."

It is expected that an announcement of examinations for some of the commissions authorized by the bill will be made at an early date. The educational qualification is graduation from an accredited school or college of pharmacy requiring the four-year course, and the age limits are 21 to 32 years. The other requirements, physical, aptitude, etc. are the general standards for the officer personnel of the Regular Army.

These are just a few necessary preliminary steps in the organization of the Corps.

Your Steering Committee is gratified that the effort was successful, and wishes to thank the members of the Committee on the Status of Pharmacists in the Government Service for the splendid and complete support received from them at every step in the bill's progress.

E. F. Kelly
Rowland Jones
H. Evert Kendig, Chairman,
Steering Committee for the Pharmacy Corps Bill

The War Department could under the provisions of the act commission pharmacists in the Army of the United States for the duration and six months thereafter. We recognize that with Army drug installations scattered all over the world today and the pharmaceutical supervision being shared by several different Corps, that it is impossible to transfer those duties to pharmacy officers and coordinate the service under one head overnight. But we do expect the plain intent of the citizens of the country, as expressed through their representatives in Congress, to be granted and made effective as rapidly as possible, with due regard to the requirements of the war effort.

Your committee is vigilant and alert regarding this situation and is cognizant of its continuing responsibilities.

So many individuals and associations have made definite contributions to the success of the Corps movement that it would be a task of

magnitude to list them separately. Also, it would take a hardier soul than your chairman to, in the parlance of the college or university, classify their efforts as excellent, good, satisfactory, fair.

However, without prejudice to the outstanding work performed by so many other workers, we believe you will approve a tribute to the few we shall mention.

First, as chairman of the Committee, I wish to praise the individual members of this committee; their names are on record as signers of this report. No chairman ever had a more willing nor a more positive group of associates. When procedures were analyzed and then approved, every member of the committee stood back of the chairman or others charged with duties of execution.

The chairman of the Steering Committee, and members of the Committee on the Status of Pharmacists in the Government Service, cannot too highly laud the great amount of work done and the immeasurable results obtained by Dr. E. F. Kelly and Rowland Jones, Jr., Esq., as members of the Steering Committee. Strategically located in Washington, both having wide acquaintanceship in Congress and thoroughly familiar with legislative procedure, much of the work of the Steering Committee was handled by them. American Pharmacy is deeply indebted to Dr. Kelly and Mr. Jones for their untiring efforts in behalf of the bill.

The four associations having membership on this joint committee, the American Pharmaceutical Association, American Association of Colleges of Pharmacy, National Association of Boards of Pharmacy and National Association of Retail Aruggists, contributed equally, to the maximum, in their respective fields. As the scope of their activities differ, so their efforts covered different areas. These associations working in complete harmony made possible the successful result.

A great degree of praise and credit for this accomplishment is due Dr. E. F. Kelly, Secretary of the American Pharmaceutical Association. As secretary of that association for so many years, he saw earlier efforts rise and fall and out of his abundant experience was able to advise the committee wisely and well; as a counselor, he was invaluable. His wide acquaintanceship in both houses of Congress he used to advantage in the interest of the bill. He gave unstintingly of his time and talents to this most important project. Your committee hereby records its appreciation and thanks.

We gratefully acknowledge the interest taken in this movement by Mr. John W. Dargavel, Secretary of the National Association of Retail Druggists. He not only mobilized the strength of the N. A. R. D. membership in support of the bill, but gave valuable advice to the Steering Committee and attended some of the important meetings of your committee.

The State Associations, their officers and particularly the secretaries, admirably carried out their part of the program, an essential part, by directly and through their county and city affiliates obtaining action from their membership. We thank their President, Mr. Chauncey E. Rickard of Pennsylvania, and their secretary, Mrs. Clara B. Miller of Kansas, for their consistent help.

We thank the legislatures of the many states which memorialized the Congress in favor of the bill. A list of these states is attached.

The National Wholesale Druggists Association and the Federal Wholesale Druggists Association rendered splendid and effective support. We especially thank their respective executive officers, Dr. E. L. Newcomb and Mr. Ray Schlotterer.

The endorsement of the Pharmacy Corps by the American Legion was of greatest value and very effectively smoothed the way in Congress. We thank Mr. F. M. Sullivan, Executive Director, and Mr. L. S. Ray, Acting Executive Secretary, National Legislative Committee, for their testimony at the House and Senate hearings, and for activating their large membership at the proper time.

We acknowledge the approval of a Pharmacy Corps by the National Drug Trade Conference. We likewise thank the numerous County and City Associations, Alumni Societies, Fraternities and Sororities, Medical, Dental and other professional societies, Civic, Scientific and all other associations which by resolution or other activity aided in the passage of the bill.

We also thank a number of individuals who presented convincing arguments in favor of the Corps to members of Congress, but who prefer to remain anonymous.

Robert L. Rodman, Editor of the Journal of the American Pharmaceutical Association, gave generously of his time and ability in the preparation of copy for the press and Committee releases, and especially we thank him for the splendid abstract of the complete testimony of the House hearings for use at the Senate hearings.

Acknowledgment must be made of the value of the work of this committee during former years. The impress of their efforts remained and the friends of the corps obtained by the activity of earlier committees were an asset of value when this committee started its drive.

A large measure of credit for the Pharmacy Corps is due pharmacist and Congressman Carl T. Durham of North Carolina. Congressman Durham, quiet, unassuming, not given to seeking distinction on the floor of the House, is a power in that body and as a member of the Committee on Military Affairs was the ideal legislator to father our bill. His efforts were untiring and the passage of the bill by unanimous consent was due in large part to his skillful parliamentary procedure and his deep personal interest in the legislation.

Senator Robert R. Reynolds duplicated Mr. Durham's House achievement in the Senate. As Chairman of the Committee on Military Affairs, in a trying situation which developed at the hearings, his astute procedure resulted in a measure granting our major objective and the unanimous favorable report of his committee. Senator Reynolds personally introduced the bill in the Senate and steered its course to acceptance by unanimous vote. He is not a pharmacist but having become convinced of the need for this legislation, he placed the full force of his dynamic personality back of the bill with the results just mentioned.

Both Congressman Durham and Senator Reynolds have earned a debt of gratitude from the people of this country and from the members of our profession which can never be met.

Congressman Harve Tibbett of Pennsylvania, a pharmacist, ably supported Congressman Durham and performed a yeomanlike service on

the minority side of the House. While the bill was introduced by a member of the majority.

The thanks of the committee are given to the Pharmaceutical Press for the editorial support of the Pharmacy Corps Bill and for the very generous news space allotted for informing its readers about the merits and progress of the legislation.

Your committee has now complied with your instructions through duly approved resolutions, and has brought about by Congressional action authorization for the establishment of a Pharmacy Corps in the United States Army. The organization of the Corps is a function and a duty of the Army. This movement was begun fifty-eight years ago in 1885. After all these years it has been consummated. Your committee feels that we should now have additional patience and grant the War Department sufficient time to make the legislation effective and set up a workable and enduring organization.

Conclusion

The merit of this legislation was certified by the unanimous vote it received in both branches of the Congress.

This effort, too, proved conclusively that given a meritorious program all pharmaceutical organizations can be aligned for its support. The Medical Department of the Army vigorously opposed this bill and the War Department was on record against it, but American pharmacy, unified, prevailed against this powerful opposition.

While the tangible results of our success are valuable, the implications are very far reaching and of the utmost importance. For the first time pharmacy has been recognized without restricting qualifications. Ultimately, this precedent will open all doors for pharmacy to participate on the proper basis where its services can be useful. That the profession will embrace with distinction its new opportunities is demonstrated by its past record of contributions to the public health and to human welfare.

H. Evert Kendig, Chairman

Major Arthur Einbeck, retail pharmacist and president of the West New York Health Department has been appointed chairman of the Joint Committee on the Status of Pharmacists in the Government Service. Major Einbeck enlisted in the Army in 1917 and served in various branches of the Medical Department until 1940 when he was transferred from the Medical Administrative to the Sanitary Corps. In 1941 he was promoted to his present rank and transferred to the Inactive Reserve because of physical disability. He comes to his new appointment well qualified by training and experience to direct the work of the Committee.

A Summary of the Report of the Committee on the Status of Pharmacists in the Government Service

At Columbus, September 9, 1943*

The report of this Committee consists of several volumes of correspondence, minutes of committee meetings, memoranda on conferences and interviews, records of congressional hearings and other documents. The chief purpose of such a report is to make a permanent record of the details of the procedures employed in the successful effort to place a Pharmacy Corps in the United States Army.

An abstract of the report has been prepared for filing with the Associations represented on the committee and for release to those interested. As this abstract of the report is itself voluminous, I shall present to you this summary of the abstract.

Veterans Administration

Higher Civil Service ratings are in prospect in the Veterans Administration.

A bill has been introduced in congress to establish a permanent Medical Corps in the Veterans Administration. It would commission 2834 physicians and dentists and 5541 nurses. Pharmacists are eligible for commissioned status in the Reserve Corps which implies that some will be on active duty. The bill is receiving the attention of your committee.

Indian Bureau

If the higher Civil Service ratings are established in the Veterans Administration it is beleved the way will be cleared for similar ratings in the Indian Bureau and other governmental agencies requiring the services of pharmacists.

Public Health Service

A bill to reorganize the Public Health Service is before congress. Your committee is working for proper pharmacists standing, with Congressman Harve Tibbett, pharmacist, a member of the committee to which the bill has been referred.

Armed Forces

The Navy. Your committee deemed it unwise to open battle simultaneously on two fronts; wherefore its work with the Navy has been confined to current matters of importance.

Immediately on conclusion of the successful campaign with the Army, your committee gave active consideration of the pharmaceutical service in the Navy. We are confident that the membership will understand that progress only can be reported at this time.

*The complete report of this committee is published in this Journal as a matter of historical record. This summary, while in part a repetition of the report, is printed because it gives in concise form the substance and meaning and valuable comments on the report by the able and inspired chairman of the committee. —Editor.

The Army. Your committee has pleasure and gratification in being able to formally inform you that the Pharmacy Corps Bill was passed and that a Pharmacy Corps in the Regular Army is in process of organization. We rejoice for the men who are in, or who may be called to the service of their country, that under Public Law 130 they will enjoy the same safeguards in the use of medicines that protects them as civilians. It is a satisfaction, too, that as an attendant circumstance, Pharmacy receives the recognition that its attainments and functions justify.

The steps taken from introduction of the bill in the 77th Congress to its passage by the 78th Congress and signature by the President July 12, have been so thoroughly publicized in the pharmaceutical and lay press that we shall not take your time to repeat them. However, our correspondence about the Corps since passage of the bill reveals particular interest in three subjects:

1. Why did the committee change its plans for changing the name of the Medical Administrative Corps to Pharmacy Corps?

2. What is being done about activating the Corps as authorized?

3. How can pharmacists benefit now under its provisions?

For your information we will answer these questions by quoting from the report:

"The hearings (Senate Committee on Military Affairs, March 2, 1943) proceeded according to plan until General White took the stand and opposed changing the name of the Medical Administrative Corps stating that in 1936, 'it was the view of the Surgeon General that the Medical Administrative Corps could well be abandoned entirely,' but 'since the beginning of the emergency the Medical Administrative Corps has become one of the most important groups we have in the Medical Department.' Later, he said, 'we must have the Medical Administrative Corps.'

"A free discussion of this matter was participated in by Senators Reynolds, Bridges, Lodge, Johnson, and Gurney; General White; Dr. Kendig. Finally, Senator Gurney suggested that the Medical Administrative Corps be retained and the bill be rewritten to add a Pharmacy Corps. This proposal was freely discussed which resulted in Senator Gurney making a motion. He said, 'I move you this bill be reported out as we have just talked, and that the language received the approval of the chairman of the committee, Senator Johnson and Senator Cabot Lodge, and when it does receive their approval it be reported on the floor of the Senate as action of the full committee.' The motion passed.

"Arrangements were made at once for a meeting a 3:00 that afternoon. Representatives of the War Department and of the Senate Committee on Military Affairs met in the Committee's room with Dr. Kelly, Mr. Jones, and Dr. Kendig and proceeded to draft an amendment to the bill to place a Pharmacy Corps in the Regular Army without disturbing the Medical Administrative Corps.

Your Steering Committee insisted that provision be made for the transfer of the 16 pharmacy officers in the M. A. C. to the Pharmacy Corps. This clause was opposed by Colonel Longfellow, a local advisor who represented General White and the War Department. He finally

agreed but said he would have to report back to General White. The conference concluded its draft at 6:15 p. m."

The next morning, June 30, the War Department submitted revision of our revision which provided for the transfer of all of the officers in the M. A.C., 16 pharmacists and 42 administrators, to the proposed Pharmacy Corps. We objected strongly to this transfer of the 42 non-pharmacists to the new corps but were advised by Senator Reynolds and Congressman Durham to accept the provision even though objectionable. We were told that unless we agreed to this compromise the bill in all probability would be vetoed by the President at the request of the General Staff.

Senator Reynolds strongly recommended acceptance pointing out that we were obtaining our major objective, a Pharmacy Corps, in the Army. He said conditions were favorable for passing the bill before Congress recessed for the summer and that he could promise favorable action now but if we decided to fight, he could not guarantee the same vote in September. Mr. Durham said he could have the amended bill passed in the House as soon as it was received from the Senate.

As you will remember, we telephoned every member of the committee and were able to talk with a large majority of them. The vote of the committee was unanimous to accept the amendment and obtain the Pharmacy Corps.

We informed Senator Reynolds of our decision, and he promptly submitted the bill with the agreed upon amendments to the Senate and and it was passed by unanimous consent on July 3rd, and sent to the House for concurrence. The House accepted the amendments and passed the bill on the unanimous consent calendar July 5th.

The bill went to the White House on July 6th and was signed by the President July 12, 1943, and it became Public Law 130-76 Congress as of that date. A copy of the law is attached as part of this report.

Soon after the bill was signed by the President, we inquired of the Surgeon General as to who would be charged with the duty of activating the Corps and were informed that the organizational matters had been placed in the hands of Colonel J. R. Hudnall. Your committee promptly called on this officer and tendered assistance in any way in which our organizations could be helpful. We were cordially received and discussed the procedures necessary for making the law effective. Captain Donald MacClare of the Medical Administrative Corps, a legal advisor, participated in the conference.

Since then, we have kept in close touch with the Surgeon General's Office and have followed the various steps taken toward organization with constructve interest.

The first important organizational action was the transfer of the Medical Administrative Corps officers to the Pharmacy Corps.

August 19th, the Adjutant General, Major General J. A. Ulio, issued an order that the insignia for the Pharmacy Corps shall be "A caduceus with the letter 'P' superimposed thereon."

It is expected that an announcement of examinations for some of the commissions authorized by the bill will be made at an early date. The educational qualification is graduation from an accredited

school or college of pharmacy requiring the four-year course, and the age limits are 21 to 32 years. The other requirements, physical, aptitude, etc., are the general standards for the officer personnel of the Regular Army.

The War Department could under the provisions of the act commission pharmacists in the Army of the United States for the duration and six months thereafter. We recognize that with Army drug installations scattered all over he world today and the pharmaceutical supervision being shared by several different Corps, that it is impossible to transfer these duties to pharmacy officers and coordinate the service under one head overnight. But we do expect the plain intent of the citizens of the country, as expressed through their representatives in Congress, to be granted and made effective as rapidly as possible, with due regard to the requirements of the war effort.

At the present stage in the organization of the Corps, provision has not been made for receiving applications for commissions in the Regular Army nor in the Army of the United States. However, this will follow in due course.

Your committe has now complied with your instructions through duly approved resolutions, and has brought about by congressional action authorization for the establishment of a Pharmacy Corps in the United States Army. The organization of the Corps is a function and a duty of the Army. This movement was begun fifty-eight years ago in 1885. After all these years, it has been consummated. Your committee feels that we should now have additional patience and grant the War Department sufficient time to make the legislation effective and set up a workable and enduring organization.

Conclusion

The merit of this legislation was certified by the unanimous vote it received in both branches of the Congress.

This effort, too, proved conclusively that given a meritorious program, all pharmaceutical organizations can be aligned for its support. The Medical Department of the Army opposed this bill and the War Department was on record against it, but American Pharmacy, unified, prevailed against this powerful opposition.

While the tangible results of our success are very valuable, the implications are far reaching and of the utmost importance. For the first time pharmacy has been recognized without restricting qualifications. Ultimately, this precedent will open all doors for pharmacy to participate on the proper basis where its services can be useful. That it will embrace with distinction new opportunities is demonstrated by its past record of contributions to the public health and to human welfare.

Service scholarships and research and teaching fellowships are available now at the Washington State College. They range in monetary value from $150 to $1000 for nine or eleven months. Non-resident tuition is not charged. Address Dean of the Graduate School.

Joint Meeting of the Council; American Pharmaceutical Association, and the Executive Committee, National Association of Retail Druggists

A joint meeting of the Council of the American Pharmaceutical Association and the Executive Committee of the National Association of Retail Druggists was held in the Continental Room of the Hotel Statler, Washington, D. C., Sunday, December 12.

Members of the A. Ph. A. Council in attendance were: R. P. Fischelis, Chairman of the joint meeting, Ivor Griffith, E. F. Kelly, H. A. B. Dunning, George D. Beal, Hugo H. Schaefer, F. E. Bibbins, R. L. Swain, B. V. Christensen, Glenn L. Jenkins, Charles H. Evans, Henry H. Gregg, Patrick H. Costello and Roy B. Cook.

Members of the N. A. R. D. Executive Committee present were: Frank Moudry, J. Otto Kohl, John W. Dargavel, John P. Tripeny, William McConaghy, P. J Suttlemyre, and Edward J. Murphy.

Others present at the meeting by invitation were: George H. Frates, N. A. R. D. Washington representative; Charles R. Bohrer, Assistant to the A. Ph. A. Secretary; Representative Carl T. Durham of North Carolina; George A. Bender, Editor; and Glenn Sonnedecker, Editor.

This meeting was the result of an agreement reached at a joint meeting of the two executive bodies, held during the recent convention of the A. Ph. A. in Columbus, Ohio, which agreement provided for annual meetings of the executive bodies, to be held in the fall of each year.

Objectives of the meeting, as set forth in the resolution adopted at Columbus, were "for the purpose of surveying and studying the resolutions adopted by the A. Ph. A. and the N. A. R. D., and by the state and local pharmaceutical associations during the year; and for a competent study of mutual problems of recognized pharmaceutical importance and significance, and for the purpose of each group dealing with these matters as circumstances may indicate."

Since the Columbus meeting, the state and local pharmaceutical associations were invited to submit copies of addresses of their presidents, resolutions adopted at their meetings, and additional topics of importance for the consideration of the joint meeting.

The agenda of the joint meeting, which was a very extensive one, was made up after a careful survey of the material submitted, of the resolutions adopted and actions taken by the two national associations. During the meeting, careful consideration was given to each item on this agenda, and from the discussions there was formulated a series of resolutions and statements which expressed the unanimous opinion of the two groups and clearly charted the course of activities to be taken in the future in dealing with these problems which are of vital interest to pharmacy.

In addition to the discussion and consideration of numerous topics upon which no specific action was required at this time, the Joint Committee adopted the statements and resolutions which follow:

Interim Committee

In view of the number and importance of the subjects which had been considered and actions taken on them during the meeting, it was unanimously agreed that an interim committee should be set up consisting of the presidents, the secretaries and the chairmen of the executive bodies of A. Ph. A. and N. A. R. D. It will be the function of this committee to continue the activities of the joint meeting in the interim between meetings, and to consider new problems that may arise. The committee will submit its recommendations to the governing bodies by mail which will facilitate action, and will make it unnecessary to bring the two executive bodies together between annual meetings except in emergencies.

Joint Committees

To further promote effective cooperation between the A. Ph. A. and the N. A. R. D. in dealing with problems and programs of mutual and continuing interest, it was recommended that the present arrangement be extended under which each association is represented on certain committees of the other association. Under this extended arrangement the N. A. R. D. would have representation on the following committees of the A. Ph. A.: National Pharmacy Week, Pharmacy War Activities, Legislation, Professional Relations, Press Relations and Social and Economic Relations.

The A. Ph. A. would have representation on the following N. A. R. D. committees: National First Aid Week, Drug Store Participation in the War Effort, Legislation, Interprofessional Relations, Public Relations, Socialized Pharmacy and Medicine.

National Pharmacy Week and First Aid Week

The programs under which National Pharmacy Week and National First Aid Week are observed was given extended consideration and a number of recommendations were submitted for the improvement of these programs, so that the public health services of pharmacy may be brought to the attention of the public more effectively. The Committees on Pharmacy Week and on First Aid Week will be requested to submit to their respective Associations recommendations for extending and improving their activities.

Collective Bargaining

The joint committee gave consideration to the need for the collective bargaining bill, H. J. R. 102, and it was agreed that the joint committee endorse and support the N. A. R. D.'s campaign for passage of the bill.

Alcohol Tax and Drawback

It was reported to the group that the A. Ph. A. and the N. A. R. D. had worked jointly on the problem of the tax on ethyl alcohol used in the preparation, preservation and dispensing of drugs and medicines and the tax drawback, on which the groups had recently filed a joint brief with the Senate Committee on Finance. The Revenue Act as recently passed

by the House increased the tax from $6 to $9 per proof gallon, and increased the drawback from $3.75 to $4.00 per proof gallon. It is understood that the Senate Committee on Finance concurred on the increase of the tax, but have increased the drawback to $6. Representatives of the two associations were requested to give close attention to this problem, and if possible to seek a simplification of the records required.

Procurement and Assignment

Following a discussion of Procurement and Assignment for pharmacists, particularly as presented by several state pharmaceutical associations, the joint committee decided to refer this problem to the Pharmacy War Activities Committee for further study and action.

Deferment of Pharmacy Students

The present situation with respect to students in pharmacy was reviewed for the information of those attending the joint meeting, and the Pharmacy Committee on War Activities was requested to continue its activities in connection with this problem.

Limitation of the Sale of Drugs and Medical Supplies

After consideration of the limitation of sales of drugs and medical supplies to pharmacies, it was pointed out that the associations had already adopted resolutions covering this subject.

Extension of Health Services

RESOLVED, that it shall be the policy of the Executive Committee of the N. A. R. D. and the Council of the A. Ph. A., in joint assembly, to seek to develop, maintain and make readily available a standard of professional service for the highest good and greatest protection of the public in accord with the American system of free enterprise under which the patient shall have freedom of choice of physician, pharmacist, dentist, nurse and other health services or persons rendering these services.

The Wagner Bill, S. 1161

RESOLVED, that the Council of the A. Ph. A. and the Executive Committee of the N. A. R. D. go on record as being opposed to the attempted regimentation of medical practices and health services and any autocratic principles contained in Title IX of the Wagner-Murray-Dingell Bill, S. 1161.

Post-War Planning

RESOLVED, by the Council of the A. Ph. A. and the Executive Committee of the N. A. R. D., in joint assembly, that inasmuch as both associations have committees on post-war planning, the joint committee recommends that these committees work jointly on post-war problems affecting pharmacy.

Public Relations

RESOLVED, by the Executive Committee of the N. A. R. D., and the Council of the A. Ph. A., in joint assembly, that we favor a public relations program which will properly interpret pharmacy to the public to the end that its relations with the public may be improved, and that in the formulation of the program, all branches of pharmacy shall have a voice and a responsibility.

Radio Publicity

RESOLVED, that the Council of the A. Ph. A. and the Executive Committee of the N. A. R. D., in joint assembly, endorse the resolution of the A. Ph. A.—"that it shall be the policy of the American Pharmaceutical Association to foster the dissemination of information relative to the services and functions of pharmacy through dignified and conservative radio addresses and dramatizations; and that steps be taken to provide for a series of suitable radio addresses and dramatizations and that a special committee on radio publicity be provided by the Association to function under the supervision and direction of the Council.", and be it further

RESOLVED, that a joint Committee on Radio Publicity be established to work on this project.

Retention of the General Maximum Price Regulation

RESOLVED, that the Council of the A. Ph. A. and the Executive Committee of the N. A. R. D., in joint assembly, favor the general principle of preventing unwarranted price increases and favor the retention of the General Maximum Price Regulation as the means of controlling prices, so that the provision of essential pharmaceutical services to the public shall not be jeopardized.

OPA Regulations

WHEREAS, the United States Department of Commerce has reported that the increase in price to consumers in the case of items representing drugs and medical supplies has increased only 0.7 per cent in the past twelve months, and

WHEREAS, these prices have been held in line largely due to the efforts of the drug industry itself; therefore be it

RESOLVED, by the Council of the A. Ph. A. and the Executive Committee of the N. A. R. D., in joint assembly, that we are opposed to any arbitrary reduction in prices by the Office of Price Administration on commodities where advances have not occurred in prices as they existed in March, 1942.

Proposed OPA Vitamin Order

WHEREAS, an attempt is being made by the OPA to reduce the price of vitamins, which action is not justified by price increases because in recent years vitamin prices have steadily decreased; therefore be it

RESOLVED, by the Executive Committee of the N. A. R. D. and the Council of the A. Ph. A., that we enter a vigorous protest with the Price Administrator against the issuance of this vitamin price reduction order, and any other orders of a similar nature.

Amendment of GMPR Ruling 27

RESOLVED, by the Council of the A. Ph. A and the Executive Committee of the N. A. R. D., in joint assembly, that we endorse the N. A. R. D.'s action asking for an amendment to the ruling to make it unnecessary for manufacturers to resort to the courts for injunctions in order to protect their Fair Trade contracts in those cases where the

GMPR interferes with minimum prices established under Fair Trade contracts.

Rent Ceilings

WHEREAS, there are at present no ceilings on rents for premises housing retail business; and whereas this situation is being taken advantage of by numerous owners of such property; and whereas rent is one of the important cost factors, particularly in the retail industry; now therefore be it

RESOLVED, by the Council of the A. Ph. A. and the Executive Committee of the N. A. R. D., in joint assembly, that we urge that the provision for freezing rentals of dwellings and apartments be extended by the proper governmental agencies to cover also premises occupied by retail establishments.

Gasoline and Tires for Delivery

WHEREAS, the reduction in value of gasoline coupons (in many instances to 50 per cent of their original value), and the lack of adequate tire replacements made available to pharmacists for delivery service, and the increased demand for essential delivery service in critical areas have caused almost the complete suspension of essential deliveries of drugs and medical supplies in many areas, therefore be it

RESOLVED, by the Council of the A. Ph. A. and the Executive Committee of the N. A. R. D., in joint assembly, that we request of the proper governmental authorities that increased supplies of both tires and gasoline be made available to pharmacists in every instance where such action is warranted.

Pharmacy Corps

RESOLVED, by the Council of the A. Ph. A. and the Executive Committee of the N. A. R. D., in joint assembly, that immediate action be requested of the Medical Department of the U. S. Army to extend the provisions of the Act creating a Pharmacy Corps in the Regular Army to the Army of the United States; inasmuch as this can be done under authority now invested in the Medical Department, and additional Congressional authorization is not required.

Pharmacists in the Navy

RESOLVED, by the Council of the A. Ph. A. and the Executive Committee of the N. A. R. D., in joint assembly, that the Committee on the Status of Pharmacists in the Government Service be requested to have introduced in Congress legislation seeking to create a commissioned Corps in the Navy for pharmacists, so that adequate and competent pharmaceutical service may be assured to the personnel of the Navy.

Food and Drug Legislation—Prescription Legend

RESOLVED, by the Executive Committee of the N. A. R. D. and the Council of the A. Ph. A., in joint assembly, that wherever possible, adequate directions shall be placed upon the packages of drugs and medicines; and that the prescription legend, "To be used by or on the direction of a physician only," should appear only on the package of those preparations containing dangerous drugs, as defined by the Food, Drug and Cosmetic Administration; and be it further

RESOLVED, that this resolution shall be brought to the attention of the officials of the Food and Drug Administration, to the manufacturers of drugs and medicines, and to the pharmaceutical law enforcement agencies in the various states.

Conservation of Narcotics

RESOLVED, by the Council of the A. Ph. A. and the Executive Committee of the N. A. R. D., in joint assembly, that the American Pharmaceutical Association be requested to appoint a committee, which will have among its members proper representation for the N. A. R. D., to consider measures for the conservation of narcotics and to provide for more uniform control of exempt narcotics.

Surplus Drugs

WHEREAS, the public health and welfare would be seriously jeopardized by the indiscriminate disposal and distribution of any surplus drugs, medicines and health supplies which may be in the hands of governmental agencies at the conclusion of the war, be it

RESOLVED, by the Executive Committee of the N. A. R. D. and the Council of the A. Ph. A., in joint assembly, that we shall seek through congressional legislation the establishment of a representative pharmaceutical body to supervise the post-war distribution of drugs, medicines, and health supplies, said body to function under adequate legislative and administrative control, and be it further

RESOLVED, that the same policy should be followed with respect to other articles commonly distributed through drug stores; and be it further

RESOLVED, that it be suggested to the pharmacists of the nation that they make careful surveys of the needs of their communities for critical and scarce drugs, so that they may be fully supplied and carry sufficient reserves to take care of emergencies.

Post-War Refresher Courses

RESOLVED, by the Council of the A. Ph. A. and the Executive Committee of the N. A. R. D., in joint assembly, that we recommend that colleges of pharmacy offer, in the post-war period, refresher or other courses for pharmacists returning from service in the armed forces of the nation; and be it further

RESOLVED, that proposals for financial aid, under a state or federal educational program for returning service men, who had or who had not completed their formal pharmaceutical education, be used to full advantage by colleges of pharmacy in the interest of such returning servicemen; and be it further

RESOLVED, that every effort be exercised to the end that proposals for any such state or Federal financial aid for education, and legislation providing for such programs, shall include pharmaceutical education; and that such programs be carried out in regularly established colleges of pharmacy with full freedom of selection by the returning service men.

Rep. Durham Commended

RESOLVED, that the Council of the A. Ph. A. and the Executive Committee of the N. A. R. D., in joint assembly and in the presence of

Congressman Durham, express to him our deep appreciation of the great services rendered by him in the successful consummation of our long efforts to establish a Pharmacy Corps in the Regular Army of the United States of America.

As this historic meeting came to a close, there remained no room for doubt as to the position of the two groups on current problems and that a program outlined for complete cooperation of the two organizations in all matters of mutual interest and concern had been formulated. It was agreed that the joint meetings will be held annually in the future in the fall of the year, the meeting places alternating between Washington and Chicago.

E. F. Kelly,
Secretary, A. Ph. A.
John W. Dargavel,
Secretary, N. A. R. D.

Changes in Pharmacy Laws in California

ALVAH G. HALL

University of Southern California

The pharmacists in California were successful in having the legislature pass the following bills which became law on August 4, 1943. These measures were supported by the various organized groups in pharmacy and the educational institutions. The assistant pharmacist classification was eliminated and the following measure allowed registration to those in active service.

> "Registration as a Licentiate in Pharmacy, Class 4, shall be granted to any person at least 21 years of age who has been registered as an Assistant Pharmacist in this state prior to September 1, 1943, and who has been actively engaged in the practice of pharmacy for the five years immediately preceding."

In an opinion rendered to the board of pharmacy by the attorney general of the state of California we were informed that the following persons who are now registered as assistant pharmacists in this state will be eligible for registration as licentiates upon presentation of the proper applications:

All persons who have been registered as asssitant pharmacists for five years prior to September 1, 1943, and have been actively engaged in the practice of their profession from that time to this date.

All persons registered as assistants who held registration in some other state immediately prior to their coming to California may count that time they practiced out of California as being actively engaged in the practice of pharmacy.

The attorney general further advises us that persons who have let their assistant registration lapse while engaged in some other occupation during the last five years are not eligible for registration as licentiates under the provisions of this Act, nor are persons who have maintained their registration as assistants but have not been practicing the profession of pharmacy for the last five years.

The addition of schedule "C" to the poison law places the responsibility with the pharmacist for the handling and sale of the barbiturates as well as the following drugs:

Acetylurea, sulphonated methanes, paraldehyde, sulfanilamide, except in tablets of thirty grains or more designed for stock purposes only and so labeled, preparations containing 5 per cent or less of sulfa salts for topical application, sobisminol, amidopyrine, cincophen, ergot, diethyl-stilbestrol, or any of their salts, derivatives, or compounds, or any preparation or compound containing any of the foregoing substances, may be sold at retail only on order or prescription of a physician and surgeon, dentist, chiropodist, or veterinary surgeon duly licensed to practice in the state of California, and shall not be refilled without order of the prescriber.

The following is schedule "C2": Amphetamine, thyroid, phenylhydantoin, or any of their salts, derivatives, or compounds, or any preparation or compound containing any of the foregoing substances or their salts, or derivatives, or compounds may be sold at retail only on the order or prescription of a physician and surgeon, dentist, chiropodist, or veterinary surgeon duly licensed to practice in the state of California. Such prescription may, however, be refilled only for the person for whom originally written.

Another measure over which there has been a great deal of misunderstanding allows any board member to grant a temporary certificate for a period of six months to an applicant who is fully qualified to take the examination for registration, but under the stress of the present working conditions does not find time to adequately prepare for the written test. The wording of the measure is as follows:

> "Any member of the board, or an inspector duly authorized by him, may examine applicants orally, or in writing, and issue a temporary certificate to practice pharmacy, which authorizes such practice for a period not to exceed six months from its date but a temporary certificate shall not be issued to an applicant who does not possess the qualifications required in this chapter."

The officers-elect of the American Pharmaceutical Association for 1944-1945 are: President-Elect—George A. Moulton, First Vice-President-Elect—Charles E. Wilson, Second Vice-President-Elect—Robert S. Lehman, and Members-Elect of Council—Robert L. Swain, Roy B. Cook, and Ernest Little.

MARRIAGES

Lucille Maud Mills, daughter of Mr. and Mrs. G. E. Mills, instructor in physiology, College of Pharmacy, University of Nebraska, and **Lieutenant Eugene Merton Sire**, field artillery, Fort Sill, Oklahoma, November 20, 1943, Lincoln, Nebraska.

NEW IN THE FAMILY

Mary Anne O'Day.—About four and a half months old (January 10, 1944). The adopted daughter of Dr. and Mrs. David W. O'Day, University of Colorado, College of Pharmacy.

Lawrence David Martin.—Born October 30, 1943. Son of Mr. and Mrs. Charles F. Martin, School of Pharmacy, State College of Washington.

Elizabeth Ann Stoklosa.—Born November 24, 1943. Daughter of Mr. and Mrs. Mitchell J. Stoklosa, Massachusetts College of Pharmacy.

New Books

Synopsis of Materia Medica, Toxicology and Pharmacology by Forrest Ramon Davison, B. A., M. Sc., Ph. D., M. B. Medical Department, The Upjohn Co., Kalamazoo, Mich. Formerly Assistant Professor of Pharmacology in the School of Medicine, University of Arkansas, Little Rock. Third Edition. 1944. 759 pages. Illustrated. The C. V. Mosby Company, St. Louis. Price $6.50.

Although it is less than two years ago since we reviewed the 2d edition of Davison's Pharmacology (July 1942 issue), so much new material has been added that the new edition is 64 pages longer than its predecessor. Of these pages, 24 have been added to the chapter on toxicology, which has been expanded to include the material that the author considers to be essential in medical practice; it now also includes a discussion of chemical warfare agents with a tabulation of a considerable number of these, their odors, physiological effects and persistence of action. The chapter on sulfonamide drugs has been enlarged by 21 pages so as to take up not only more recent information about the older members of this group, but also an evaluation of the most recently prepared substances of this type of antiseptic, with considerable information on the assay of sulfonamides. Ten pages have been added to the topic of vitamins, especially dealing with the vitamin B complex and vitamin K; one now finds a table with the "recommended daily allowances for specific nutrients" originally prepared by a committee of the National Research Council, and also one of the more optimistic reports on the antigraying factors. The chapters on hormones and disinfectants, especially the microbiotic agents, such as penicillin, also have been thoroughly revised. In fact, the book has been so well revised that it is difficult to find any of the recent advances omitted. In conclusion, the reviewer is in some doubt that the propylene glycol "toxicity is similar to that of glycerin," though in presently advocated oral dosage it may be quite harmless. To the topic of "What you should know about drugs" on page 34, he would like to add: The speed, degree and duration of action of the drug in question, of course depending upon the method of administration.

H. G. O. H.

Laboratory Manual for Vertebrate Physiology, by D. M. Pace, Ph.D., Associate Professor of Physiology, and K. K. Kimura, B.S., Department of Physiology and Pharmacology, College of Pharmacy, University of Nebraska. 1943. 101 pages. Illustrated. Printing Department of the University of Nebraska. Price $1.75.

The authors have prepared a laboratory manual for general vertebrate physiology in a clear, but sufficiently comprehensive manner. The manual is written so that students may carry out laboratory experiments in physiology with the minimum amount of explanation from the instructor. Eighteen illustrations are included in the manual for clarification. Fifty-one exercises provide enough material to be covered in two semesters. The exercises include experiments on (1) movement, (2) physiology of nerve, (3) receptors, (4) blood and circulation, (5) respiration, (6) metabolism, (7) nutrition, (8) digestion, (9) absorption, and (10) endocrines. The exercises are written so that two students may successfully carry out any exercise, but at his discretion the instructor may use any of the more difficult ones as demonstration experiments. Questions are freely interspersed in the text to stimulate the students to consider the significance of the experiments and to correlate them with the general lecture. Five pages are devoted to appendix material such as tables on blood pressures, metrological tables, formulæ for various physiological solutions, and tables on physiological normals for man. The manual was written to accompany a course in physiology given to pharmacy, dental, health technician, and general students.

Doctor in the Making, The Art of Being a Medical Student, by Arthur W. Ham, M. B., Associate Professor of Anatomy, in charge of Histology, Faculty of Medicine, University of Toronto, Honorary Secretary of the Banting Research Foundation and M. D. Salter, M. A., Ph. D., Lecturer and Research Fellow in the Department of Psychology, Faculty of Medicine, University of Toronto. 1943. 179 pages. Illustrated. J. B. Lippincott Company. Price $2.00.

This book was written for the benefit of the medical student as he begins his professional studies. It is divided into three parts. The first part deals with motivation and equipment. The second part, with the enemies of success and how to defeat them. The third part, with the responsibilities of the medical student. The titles of the chapters are as follows: You and the Medical Course, The Fifth Column in Your Mind, Thinking that the Important Things Come Later, The Time Swindler, Organizing Your Knowledge, Memory Versus Understanding, Forgetting, Your Child-self, The Allocation of Time, Understanding and Applying the Scientific Method and Do's and Don'ts for the Student. As one runs over these titles he is struck by the fact that they touch his own weak points in his college days. So impressed was the reviewer with the value of the book that he used it for the first four weeks this fall in an orientation class for freshman pharmacy students with surprisingly satisfactory results. It is unfortunate that the authors did not use a more comprehensive title and draw their illustrations from a wider field. The subject matter is just as applicable to students of pharmacy and dentistry as it is to medicine. If the title had been The Professional Man in the Making or The Art of Being a Professional Student it would have had a wider appeal. With the proper explanation on the part of the instructor the book can be made most useful to the students of pharmacy or dentistry. R. A. L.

INSTITUTIONS HOLDING MEMBERSHIP IN THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

University of Nebraska, College of Pharmacy, Lincoln. Rufus A. Lyman, Dean (1913)

NEW JERSEY

Rutgers University, The State University of New Jersey, New Jersey College of Pharmacy, Newark. Ernest Little, Dean (1928)

NEW YORK

University of Buffalo, School of Pharmacy, Buffalo. A. R. Lemon, Dean (1936)

Columbia University, College of Pharmacy of the City of New York, New York. Charles W. Ballard, Dean (1937)

Fordham University, College of Pharmacy, New York. Charles J. Deane, Acting Dean (1939)
(Charles J. Deane)

Long Island University, Brooklyn College of Pharmacy, Brooklyn. Emma H. Schaefer, Dean (1938)

NORTH CAROLINA

University of North Carolina, School of Pharmacy, Chapel Hill. J. Grover Beard, Dean (1917)

NORTH DAKOTA

North Dakota Agricultural College, School of Pharmacy, Fargo. William P. Sudro, Dean (1928)

OHIO

Ohio Northern University, College of Pharmacy, Ada. Rudolph H. Eagon, Dean (1928)

Ohio State University, College of Pharmacy, Columbus. Bernard V. Christensen, Dean (1900)

University of Toledo, College of Pharmacy, Toledo. George L. Baker, Dean (1941)

Western Reserve University, School of Pharmacy, Cleveland.
F. J. Bacon, Acting Dean (1902)

OKLAHOMA

University of Oklahoma, School of Pharmacy, Norman. David E. Worth Johnson, Dean (1908)

OREGON

Oregon State College, School of Pharmacy, Corvallis. Adolph Ziefle, Dean (1918)

PENNSYLVANIA

Duquesne University, School of Pharmacy, Pittsburgh. Hugh C. Muldoon, Dean (1927)

Philadelphia College of Pharmacy and Science, Philadelphia. Ivor Griffith, Dean (1900)

Temple University, School of Pharmacy, Philadelphia. Ira Everett Kendig, Dean (1925)

University of Pittsburgh, Pittsburgh, College of Pharmacy, Pittsburgh. C. Leonard O'Connell, Dean (1906)

PHILIPPINES

University of the Philippines, College of Pharmacy, Manila. Mariano V. del Rosario, Dean (1917)

PUERTO RICO

University of Puerto Rico, College of Pharmacy, Rio Piedras. Luis Torres-Diaz, Dean (1926)

RHODE ISLAND

Rhode Island College of Pharmacy and Allied Sciences, Providence. W. Harry Howard, Dean (1926)

SOUTH CAROLINA

Medical College of the State of South Carolina, Charleston. William A. Frost, Acting Director (1941)

University of South Carolina, School of Pharmacy, Columbia. Emery T. Mallory, Dean (1928)

SOUTH DAKOTA

South Dakota State College, Division of Pharmacy, Brookings. Floyd J. La Blanc, Dean (1898)

TENNESSEE

University of Tennessee, School of Pharmacy, Memphis. Robert L. Crossland, Dean (1914)

TEXAS

University of Texas, College of Pharmacy, Austin. William P. Gilbert, Dean (1928)

VIRGINIA

Medical College of Virginia, School of Pharmacy, Richmond. Wortley F. Rudd, Dean (1908)

WASHINGTON

State College of Washington, School of Pharmacy, Pullman. Pearl H. Dickson, Dean (1912)

University of Washington, College of Pharmacy, Seattle. Forest J. Goodrich, Dean (1908)

WEST VIRGINIA

West Virginia University, College of Pharmacy, Morgantown. J. Lester Hayman, Director (1928)

WISCONSIN

University of Wisconsin, School of Pharmacy, Madison. Arthur H. Uhl, Director (1908)